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ABSTRACT

One of six annexes to a report prepared by members of an economic commission that visited China in 1984, this document examines recent developments in Chinese primary and secondary education and issues related to a proposed introduction of a 9-year basic educational system. It outlines educational prospects to the year 2000 and explores technical and vocational education in relation to technical manpower, demand, and supply. Issues pertaining to specialization, duration and level of training, shortages of staff and facilities, administration, and the status of technical and vocational education are examined, along with the demand for and supply of staff in primary and secondary education and issues related to teacher training, curriculum, educational structures, and administration and teacher status. It concludes with a review of costs and financial issues in education and proposes specific educational prospects. Tables and charts are included, and appendices give data on China's educational structure and provide other selected statistics. (JHP)

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A WORLD BANK COUNTRY STUDY

CHINA

Issues and Prospects in Education

Annex 1 to

CHINA

Long-Term Development Issues and Options

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A WORLD BANK COUNTRY STUDY

CHINA

Issues and Prospects in Education

Annex 1 to
CHINA
Long-Term Development Issues and Options

The World Bank
Washington, D.C., U.S.A.

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Preface

This report is one of six annexes to a main report entitled China: Long-Term Development Issues and Options. The complete list of annex volumes is:

Volume 1 - China: Issues and Prospects in Education
Volume 2 - China: Agriculture to the Year 2000
Volume 3 - China: The Energy Sector
Volume 4 - China: Economic Model and Projections
Volume 5 - China: Economic Structure in International Perspective
Volume 6 - China: The Transport Sector

(Note: Throughout this volume references to Annexes A, B, C and so on refer in that same order to Annex Volumes 1, 2, 3 etc.)

The main report and annex volumes were prepared principally by members of an economic mission that visited China twice in 1984, for four weeks in February/March and for five weeks in April/May. In addition to Beijing, the mission went to three provinces: one coastal and relatively high-income (Jiangsu); one inland and average-income (Hubei); and one interior and low-income (Gansu). It received a lot of information, as well as numerous valuable comments and suggestions, from officials and others in these provinces, as well as from those in many central agencies and institutions, including: the State Planning and State Economic Commissions; the Ministries of Finance, Agriculture, Coal, Communications, Education, Foreign Economic Relations and Trade, Labor and Personnel, Petroleum, Railways, Urban and Rural Construction, and Water Resources and Electric Power; the State Statistical Bureau; and various universities and research institutes of the Chinese Academy of Social Sciences. A series of seminars was organized by the Technical-Economic Research Center under the State Council. The generous and thoughtful assistance of all these people in China contributed greatly to the preparation of the reports.

The Bank mission was led by Edwin Lim (mission chief) and Adrian Wood (deputy mission chief), and also consisted of William Byrd (economist), Mats Hultin (senior education adviser), Erh-Cheng Hwa (senior economist), Timothy King (senior economist), Jacques Yenny (senior transport economist), Umnuay Sae-Hau (research assistant), Betty Ting (interpreter), Luc De Wulf (senior economist, International Monetary Fund), Benjamin King (consultant on statistics), Wouter Tims (consultant on planning and agriculture); and the following teams:

Agriculture: J. Goering (team leader, April/May), Tom Wiens (team leader, February/March), Lang-Seng Tay (irrigation specialist), Lo-Chai Chen (fishery consultant) and Fred Bentley (consultant on arid agriculture);

Energy: Roberto Bentjerodt (senior economist, coal projects), Weigong Cao (power engineer), Abdel El-Mekkawy (engineer, petroleum projects), Robert Taylor (energy economist), and Darrel Fallen-Bailey (consultant); D.C. Rao (Assistant Director, Energy Department) led the team in the field;

Industrial Technology: Gene Tidrick (team leader), Anupam Khanna (industrial economist), Reza Amin (industrial specialist), and Josephine Woo (research assistant);

Location and Trade: Ian Porter (team leader), Vernon Henderson (consultant on urbanization), John Sheahan (consultant on industrial location and trade) and Samuel Ho (consultant on rural nonfarm activities).

The following also contributed to the preparation of the reports: Wlodzimierz Brus (consultant on socialist economies), Gerhard Pohl (energy and transport), Robert Drysdale (Annex Vol. 1); Helena Ribe, Nikhil Desai (Annex Vol. 3); Shujiro Urata (Annex Vols. 4 and 5); and Lily Uy (Annex Vol. 6). Larry Westphal, Carl Dahlman and Bruce Ross-Larson organized background work on technology. Behrouz Guerami-N, Tejaswi Raparla, and Kong-Yam Tan helped with the multisectoral model, the input-output table and data for international comparisons. Ann Orr, Kenneth Hill, Moshe Syrquin, J.V.S. Sarma, Kenneth Cochran, Chang Hsin, Liu Ying and Cai Jinyong undertook research. Linda Mitchell and Terrice Bassler edited the reports; and Helen Kung assisted in their processing.

The reports also benefited from comments of a review panel consisting of Anne O. Krueger, Luis de Azcarate, Kemal Dervis, Janos Kornai (consultant) and managers of the East Asia and Pacific Regional Office.

In addition to the main report and annex volumes, the following background papers have been prepared and are being issued as World Bank Staff Working Papers:

1. "The Asian Experience in Rural Nonagricultural Development and its Relevance for China"
2. "International Experience in Urbanization and its Relevance for China"
3. "Alternative International Economic Strategies and their Relevance for China"
4. "International Experience in Budgetary Trends during Economic Development and their Relevance for China"
5. "Productivity Growth and Technological Change in Chinese Industry"
6. "Issues in the Technological Development of China's Electronics Sector"
7. "The Environment for Technological Change in Centrally Planned Economies"
8. "Managing Technology Development: Lessons from the Newly Industrializing Countries"
9. "Growth and Structural Change in Large Low-Income Countries"

The main report, other annex volumes and background papers are available from World Bank Publications, P.O. Box 37525, Washington, D.C., 20013 or from World Bank distributors listed on the last page of this volume. Prices will be furnished upon request.

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CURRENCY EQUIVALENTS

The Chinese currency is called Renminbi (RMB). It is denominated in Yuan (Y). Each Yuan is

1 Yuan = 10 jiao = 100 fen

In early 1984 the official exchange rate of the Yuan to the US dollar was around Y 2 = US$1. The internal settlement rate (ISR) of Y 2.8 = $1, however, was used in most merchandise transactions. The official exchange rate is now about Y 2.8 = $1. On January 1, 1985, the Government abolished the ISR.

WEIGHTS AND MEASURES

Chinese statistics are usually in metric units; in addition, mu and jin are often used:

1 mu	=	0.1647 acres = 0.0667 hectares
1 jin	=	0.5 kg

FISCAL YEAR

January 1 - December 31

TRANSLITERATION

The Pinyin system is used in this report.

Note: In tables, individual items may not sum exactly to totals because of rounding errors.

SUMMARY

1. China's achievements in education since 1949 have been unmatched among developing countries of the same income level. Enrollments in formal and nonformal primary and secondary education have been high by any standards. The supply of teachers and didactic materials has in many respects been good and student performance, as far as can be assessed, quite high. Self-help programs in education have been more successful in China than in most other countries. The Government has been able to keep the costs of major education programs under control, and China has - unlike the rest of the developing world - been able to introduce improvements in the education system without any serious strain on public expenditures.

2. China's education system has nevertheless had problems in recent years. Events during the Cultural Revolution seriously lowered the quality of education and sharply reduced the output of qualified manpower. Manpower shortages, affecting industry, agriculture, transportation and other economic sectors, have hampered achievement of the four modernizations. Accompanying shortages of qualified manpower has been an abundance of unqualified workers and staff at several levels, leading to low efficiency in enterprises and also in education. Since 1976, the Government has been quite successful in introducing measures to improve the output of qualified manpower and the overall education profile of China's population.

3. Over the last few years, developments outside the education sector have begun to have an impact on schooling. The change that has had the most far-reaching effect is introduction of the production responsibility system in rural areas. Linking production more to individual effort than it was in the past has apparently made rural parents, at least initially, less willing to send or maintain their children in school. In addition, new opportunities for productive work outside school may be a drain on the time and effort of locally hired teachers. Some changes have been made in the running of urban enterprises, but on a much more limited scale than the changes in rural areas. However, other changes affecting employment have also taken place: the former system of controlled labor allocation is no longer applied across the board, and some of the barriers to professional mobility and restrictions on rural-urban population movements seem to be relaxing somewhat. These changes will have an indirect impact on education because of their influence on students' job opportunities and career choices.

4. The focus on the rehabilitation of higher education during the last 7-8 years has been justified given the damage to higher education during the preceding decade. It is now appropriate to consider other parts of the education system also, to ensure that the base of the system is well developed. This annex has identified issues in general and technical/vocational education and in teacher training that will need to be dealt with during the next 15 years if the Government is to achieve its education policies and goals. Tentative estimates of future recurrent costs and investment needs have been made. These issues and prospects are summarized in the following paragraphs.

Universal Basic Education

5. The Government has proclaimed its goal of making six years of primary education and three years of lower secondary education universal by the end of this century. The Government is thus de facto introducing a nine-year basic education system. Based on the World Bank's preliminary projections, absolute enrollments at these levels would decrease from 174 million to 135-140 million as universal basic education is achieved, because the fertility decline is predicted to continue. Constraints on achievement of universal basic education during the next 15 years are discussed below.

6. Enrollments have decreased in both primary and secondary education during the last few years. The intake of new students has declined more than can be explained by the reduction in the relevant age groups. Dropout rates have remained high. In the poorer regions of China, where there is little technological advance in agriculture or opportunity for nonagricultural employment, the economic returns to education must seem very low. Farmers are not convinced that there is a good economic return on primary education for their children, especially females. They see the opportunity costs of education for their children increasing with the introduction of the responsibility system in agriculture and would therefore rather keep some children engaged on the farm or in the household rather than in school. The Government has taken steps to reverse the decline in enrollments and reduce the number of dropouts, apparently with more success in primary than in secondary education. But increased local financial self-reliance in basic education seems to have aggravated the problems of poorer areas, where enrollment and educational quality were already unsatisfactorily low. Moreover, the factors which caused the enrollment decline will persist and may present an obstacle to achieving the goal of making nine years of basic education effectively universal by the end of the century.

7. Rural parents and poor city dwellers often see education as a way out of rural life and urban poverty and as a means of achieving a higher standard of living. Reintroduction in the late 1970s of the key-school (K-school) system in primary and lower secondary education may have thwarted such expectations in China. These schools appear to favor pupils in urban areas and children of economically better off and better educated parents everywhere, at the expense of pupils in rural areas and children of less prosperous and less educated parents. The K-school system perpetuates the perception among poor people of a two-track system in basic education, one elite track - mainly for urban students - which leads to further education and promising careers in adult life, and a second track - mainly for rural children - which is terminal and, furthermore, less relevant for the adult life of a peasant or urban manual worker. It is difficult to justify application of the K-school concept in basic education: research and experience in other countries indicate that it is not only inequitable but also pedagogically and economically unjustifiable. More recently, Government has discouraged the designation of K-schools at the primary level. Many of them have even converted to experimental schools with additional responsibility to provide support for neighboring schools.

8. The average Chinese pupil in primary and lower secondary education has textbooks but they could be improved in design, workmanship and content. There is a scarcity of other didactic materials and the physical school environment is often poor. Favorable demographic developments and financial gains that could be achieved by increasing student/teacher ratios provide an opportunity to improve the supply of materials nationwide. A universal nine-year basic education system will require more and also different equipment and didactic materials.

9. Experience from other countries shows that the introduction of a nine-year basic education system requires much work in curriculum and staff development, and physical planning to achieve the objectives of basic education. One concern is the role of K-schools in a nine-year basic education system. However, the most compelling problem, and the one that could have the most severe consequences for economic growth in the long term, is the erosion of schools' holding power. The Government is making an effort to popularize education by disseminating information about its benefits in terms of increased productivity and family well-being, and these efforts could be strengthened. Increased financial support from higher levels of Government for schools in poorer areas will also be essential. Finally, the proposal to make completion of primary education mandatory has been instituted already in one province and is likely to be an effective means of improving attendance nationwide.

Technical and Vocational Education

10. There are few issues in general upper secondary education, one function of which is to prepare students for higher education. The Government has recently curtailed enrollments in this type of education as a means of reducing the pressure for university places. Enrollments will eventually increase again and triple the current enrollment of approximately 5.5 million students, to some 15 million, by the year 2000; this would correspond to an enrollment ratio of about 30% of the relevant age group. The quality of education offered is good, the quantity generally appropriate, and application of the K-school concept justified.

11. The situation in technical/vocational secondary education is quite different. The almost complete abolition of formal technical and vocational secondary education in China during the Cultural Revolution has caused a serious shortage of middle-level technical and managerial manpower in industry, agriculture and other economic sectors. Many technical and skilled worker training schools have now reopened and a great effort is being made to provide exposure to vocational subjects in many general secondary schools by offering courses in industry, services, business and agriculture. Advancement of the four modernizations and a tripling of GNP will require huge efforts in technical/vocational education to complement those already well underway in higher education. The specific need for technical/vocational education to support various economic sectors has only been marginally explored, but greater efforts in formal and nonformal agricultural and service sector education appear necessary.

12. Technical/vocational education in China compares well with that in many developing countries at the same income level, and the recovery after the damage caused by the Cultural Revolution has in many ways been admirable. The system suffers, nevertheless, from weaknesses that make support of the four modernizations difficult and that increase recurrent costs and investment needs more than necessary. Since 1976, progress in developing the system has been uneven.

13. Enrollment in technical and skilled worker training schools run by various line ministries has decreased, while the vocationalization of general secondary education has proceeded with increasing student enrollments. Nonformal training has assumed a large role and appears to meet half of annual training needs. The vocationalization program and nonformal training should develop further - the latter with assistance from enterprises and offered mainly on a spare-time basis - but enrollment in technical/skilled worker training schools should not be allowed to decline given the existing major manpower shortages. Furthermore, the general low utilization of staff, equipment and facilities in these schools suggests that they could increase their enrollment considerably, with reasonable additional costs, if they used a mixed boarding and day-school system. Better use of existing facilities would reduce, though not eliminate, the need for new buildings.

14. Attempts are being made to broaden the curricula of technical and skilled worker training schools and reduce the number of specializations offered. These changes aim to make technicians and skilled workers more flexible and adaptable in using new production techniques and work methods, and facilitate labor transfers and industrial restructuring. A review and revision of curricula would be even more useful if accompanied by a survey of school facilities at the provincial level to assess the need for new or remodeled facilities - particularly for technical programs in vocationalized secondary schools.

15. About 80% of the students in China's technical schools have a full junior and senior secondary education as a base for their technical studies. This is a high entrance level, which increases costs for both the public and the students, mostly without corresponding benefits in learning or skills. Technical and skilled worker training schools should generally require 8-9 years of general education as a base. Shorter postsecondary courses could be justified, as an exception, for a minority of students.

16. The administrative and managerial responsibility for technical/vocational education is divided among many line ministries and their subordinate agencies. This allows good vertical cooperation within the system. Horizontal cooperation between schools run by different agencies is, however, limited, which leads to underutilization of staff and facilities, duplication of teaching, and unnecessarily large student catchment areas.

17. The Government has embarked on a program to vocationalize about 50% of upper secondary education. This program, which may cover skills for jobs in agriculture, commerce, and industry, as well as personal services is designed to alleviate apparent skill shortages as well as reduce heavy pressure on university entrance. However, the experience of other countries

with secondary vocational education has been mixed. Such programs are of much higher cost than general secondary, but it is not always clear that they necessarily produce more productive workers, particularly in industrial trades. In some countries secondary vocational schools suffer from inappropriate equipment and outdated curricula. There may also be a tendency, already evident in China, to overspecialize thereby limiting the adaptability and even trainability of workers at later stages of employment. A system of secondary education that achieves intermediate general qualifications might provide the required flexibility for quickly responding to the demand for a particular type of manpower and be preferable to provision of specific skill training in a narrowly defined specialization at the secondary level. These considerations suggest that the Government should proceed with caution and only after careful assessment of alternative models in China and elsewhere. An effort at school location planning should precede full implementation of the program. To minimize costs, the Government should make full use of the staff and facilities in existing and new schools and in enterprises. Revised and broadened curricula are needed, as well as expanded and improved production of didactic materials. Finally, means of improving the status of technical/vocational education need to be found.

Teacher Training

18. China employs more teachers than would be considered necessary in many countries. Student/teacher ratios are low, and teachers have correspondingly low workloads at all levels. Approximately one of every two teachers is unqualified according to official government standards. Preliminary projections to the year 2000 show that the aggregate need for teachers in basic and upper secondary education (including technical and vocational education) would probably decline somewhat. There would be a decrease in the demand for class (primary) teachers because of the predicted enrollment decline, while the demand for academic and technical and vocational subject teachers would increase. A summary of the projections on teacher requirements is given below.

Stock and Future Need for Teachers
(million)

Year	9 years' basic education		3 years' upper secondary education		Total
	Class teachers/a	Subject teachers/b	Academic subject teachers/c	Vocational/technical subject teachers	
1983 stock	5.4	2.1	0.5	0.1	8.1
2000 need	3.8	2.3/2.1	1.3/1.2	0.8/0.4	8.2/7.5
Change	-1.6	+0.2/+0.0	+0.8/+0.7	+0.7/+0.3	0.1/-0.6

/a For the six lower grades, i.e. the present primary schools.
/b For the three upper grades, i.e. the present lower secondary schools.
/c Includes teachers in primary teacher training schools and teachers in academic or theoretical subjects in technical/vocational programs.

Source: World Bank estimates.

19. These projections suggest that the preservice training of primary teachers needs to be reduced. A large percentage of the primary teacher stock is unqualified, however, and there is a need to continue inservice upgrading programs until the end of the century. In secondary education, preservice teacher training programs would need to double their output, and this has been planned for. Current inservice training of secondary teachers would also need to continue.

20. Preservice teacher training colleges in China currently emphasize subject knowledge at the expense of teaching in pedagogy, psychology and education. This emphasis is understandable given the neglect of subject knowledge during the Cultural Revolution. Nevertheless, strengthening of both teaching and research in pedagogy and in psychology is suggested.

21. The common administrative separation of preservice and inservice teacher training in China prevents full and efficient use of staff and facilities and reduces feedback to the colleges on actual teaching experience. Since China's inservice and preservice teacher training needs will vary from year to year, maximum flexibility is needed in the system. Such flexibility would be promoted by administrative cooperation.

22. Despite recent salary increases, teaching is not seen as an attractive profession in China. This is a difficult issue to resolve. High quality teachers contribute more to good student performance than other inputs, and recruitment of able students to teacher training institutions is therefore a high priority. It is also important to deal with the negative influence of the rural responsibility system on the recruitment and work of primary teachers.

Costs and Financing

23. China has considerably increased spending on education during the last few years but nevertheless devotes a smaller share of GNP to education than many other developing or developed countries. This is particularly true of primary education. In higher education, student costs remain high primarily because of low internal efficiency. Teacher salaries are low, in both absolute and relative terms.

24. The World Bank has estimated the recurrent cost implications of introducing a nine-year basic education system and a vocationalized upper secondary school system that would enroll 50% of students in technical and vocational programs. The recurrent cost of the necessary teacher training has also been estimated, as has the capital cost of equipment needed. The World Bank does not, however, have the requisite knowledge of existing school facilities to estimate capital needs for building construction or rehabilitation.

25. The Government should be able to meet the recurrent costs of a nine-year basic education system, though the recommended increases in teachers' salaries would probably increase expenditure above the current level. The vocationalization of upper secondary education will increase recurrent costs for consumables, school maintenance and teachers (even if student/teacher ratios can be increased). Recurrent costs for teacher training are projected to double, but unit costs could remain unchanged.

26. Equipment costs for the universal basic education program should be reasonable. Equipment costs for the vocationalization program would be high, even if cost saving measures (such as using facilities in double shifts) are systematically applied.

27. Tentative estimates (in 1982 prices) have been made of the public recurrent and capital costs of education. It has been assumed that GNP will triple by the end of the century and that teachers' salaries will increase in line with the growth of GNP per capita. The recurrent cost of education is estimated to increase from Y 14 billion in 1982 to Y 33-38 billion by the year 2000. The recommended raise in teachers' salaries relative to other wages would further increase total recurrent costs; for example, a 50% increase in teachers' salaries would add Y 9-10 billion to recurrent costs in the year 2000. The capital cost for equipment is estimated at just over Y 21 billion from 1982-2000, or about Y 1 billion per year. The cost of building construction and remodeling is likely to amount to 10% of annual recurrent expenditure. Total annual public expenditure on education might thus amount to Y 46-52 billion in the year 2000. This figure is equivalent to about 3.1-3.5% of estimated GNP in that year; this percentage is similar to the present allocation for education and still below the average for other LDCs (4-5%).

CHINA: ISSUES AND PROSPECTS IN EDUCATION [1/]

1. BACKGROUND

1.01 The World Bank's report entitled China: Socialist Economic Development (Report No. 3391-CHA, issued in June 1981) included an annex on education and training which described developments in education up to 1981 and discussed the overall manpower situation in China. The annex covered the objectives, structure, dimensions, content, quality, technology, administration, staffing, costs and financing, and external and internal efficiency of current education and training.

1.02 The annex concluded with an analysis of the strengths and weaknesses of the system. It stated that the development of human resources in China since 1949 had in many ways been commendable. Expansion in primary school enrollment had made two-thirds of China's adult population literate. The secondary school enrollment ratio was considerably higher than that of comparable countries. Adult nonformal education, particularly programs run by industry and often executed with the help of mass media, had played an important role in improving the labor force. In many respects the quality of China's education was good. The education program had been carried out with little foreign assistance after the USSR withdrawal in 1960. Self-help schemes were important and had been more successful than in many other developing societies. China had furthermore carried out its education programs at an affordable cost.

1.03 There were, however, problems in China's education. A serious shortage of high-level manpower in China had been caused primarily by the disruptions to university education during the late 1960s and early 1970s. The system of technical/vocational education had been unable to produce sufficient middle-level technicians to meet the needs of agriculture, industry, transportation and other sectors. The broad expansion of primary and general secondary education had taken place without sufficient attention to quality: there were too many unqualified teachers and too many schools without appropriate facilities and equipment. Though the self-help schemes had many advantages, they had tended to increase differences in school quality by location, a serious question in China where rural-urban disparities were large. At all levels of the education system, internal efficiency was low as measured by the utilization of staff and facilities, and as compared with other societies.

1.04 The annex summarized its findings and recommendations by stating that:

(a) expansion and improvement of higher education should be seen as the first priority, including both preservice and inservice education;

1/ This paper focuses on basic education, technical and vocational education, and teacher training.

(b) expansion and improvement of technical/vocational education was the second priority. For financial reasons much technical/vocational education would have to take place within enterprises, in addition to being offered in formal schools, and the program would have to be executed over a fairly long period;

(c) teacher training would be a precondition for the execution of China's education programs, and for economic, social and pedagogical reasons it should emphasize inservice training;

(d) planned expansion of general education to cover the first nine years of schooling was feasible considering favorable demographic trends, but increased attention should be paid to qualitative improvement by means of improved curricula and learning materials, and an expansion of the production of didactic materials was suggested;

(e) efforts should be made to improve the internal efficiency of education at all levels; and

(f) the expansion and improvement of education could be achieved without increasing recurrent expenditures beyond the average range for developing countries, measured as a percentage of GNP. Assistance for capital investments would be needed, however.

1.05 These recommendations (a) - (f) have been reflected in subsequent World Bank education lending and in the dialogue between Chinese authorities and the World Bank. Education projects approved so far cover the development of China's comprehensive universities, of higher education and research in agriculture, of health education, of the television university system and of a new polytechnic (short-term technical college) system. Proposed future activities include various universities run by technical ministries, technical/vocational education, teacher training, curriculum development and the manufacture of didactic materials, including textbooks.

Recent Developments

1.06 Development of the education sector in China since 1981 has been characterized by systematic implementation of government policies and programs established in the late 1970s. The Government's major principles established at that time were stated as follows:

" (a) education must be geared to the needs of socialist construction and modernization, and the proportion of expenditure on and investment in education must be adjusted and raised;

(b) education is to be developed effectively and steadily in accordance with the policy of readjusting, restructuring, consolidating and improving the economy;

(c) in view of the large population, and poor economic foundation, there should be priorities in the development of education and resources should not be evenly distributed among too many projects;

(d) the relationship between popularization and the raising of standards should be handled correctly; the effective universalization of primary education should be a priority, and enough attention should be given to education in areas inhabited by minority nationalities;

(e) educational structure must be transformed;

(f) a diversified educational system should be adopted so as to achieve greater, faster, better and more economic results in educational development; and

(g) efforts should be made to raise the level of teachers and to further strengthen the teaching force."

1.07 These policies were supplemented in 1982 with the following specific statements by the Ministry of Education to all provincial, county and city bureaus of education:

" (a) primary and secondary education should strive to develop moral, physical and intellectual capacities and should not over-emphasize examination scores. The schools should not concentrate on the graduating class and ignore the others; and

(b) key schools (K-schools) are necessary for ensuring the quality of education, However, since primary education should aim at becoming universal, there will be no entrance examination to the key schools. All students to the K-schools will be admitted from the neighborhood."

There have been no major changes in these policies, though financial constraints have apparently forced the authorities to postpone the completion dates for some programs. There have, furthermore, been no major changes in the objectives, structure, content, technology, staffing, costs or financing of China's education since 1981.

1.08 While educational development has been fairly stable, changes in other economic sectors have affected the environment in which the sector functions. The most significant change, introduction of a "production responsibility" system, has occurred in rural areas (where 80% of the population lives) in an attempt to improve incentives and management at all levels of the agricultural economy. Under this system, individual families are allocated land by the commune and then have full responsibility for farming it. The household has certain obligations (to pay their share of taxes, contribute to the welfare fund and help meet state procurement requirements) but beyond these may retain the remaining agricultural production, or sell products on the open market.

1.09 This is a significant change from the old system, under which incomes were shared more or less equally among commune members regardless of individual productivity. For education, this change has had unexpected consequences. Attendance at school may now result in income foregone (children

could instead work productively on the farm or in the house, or even tend younger children, thus freeing parents for productive tasks). In addition, locally hired teachers, who were previously given work points like other workers and shared profits accordingly, also receive a plot of land under the responsibility system; since they also farm the land for profit, this is likely to become a priority demand on their time, to the neglect of their performance in the classroom.

1.10 Similar changes have also been instituted in urban areas, but only on a limited basis, and their impact has so far been much less. A system of productivity bonuses has been introduced to link earnings to output, but earnings differentials appear to offer workers only a limited incentive to increase productivity. Disincentives to increased productivity remain. Employment still tends to be secure. Managers have little control over the recruitment, promotion and dismissal of workers. The controls on labor mobility promote life-time assignments within one enterprise and offer few possibilities for transferring as a reward for good performance. Workers are linked to their enterprise in many ways; pensions, housing and health care are usually provided through the enterprise. Employees may also receive education and training in enterprise-sponsored programs. This immobility of labor leads to overspecialization (a problem as China undergoes structural transformation and moves towards becoming a middle-income economy) and prevents the spread of experience and new technology.

1.11 Other changes affect employment opportunities. The system of controlled labor allocations is no longer applied across the board: it is still used for most postsecondary graduates and skilled manual workers, but not for those with limited skills; graduates from the newly established postsecondary polytechnics also seek employment independently. Enterprises may now examine job applicants sent to them by labor bureaus. The unemployed, especially the young, are being encouraged to organize small collective enterprises or create opportunities for self-employment. The hiring of labor (up to eight people) is now permitted.

1.12 In 1979, China introduced a policy promoting the one-child family, with the aim of limiting the population to 1.2 billion by the year 2000. The impact of the one-child policy already appears to be greatest in the major cities, where third order births account for less than 5% of the total. Moreover, the responsibility system in agriculture seems to be leading to more children being born to rural families, presumably because land allocations usually depend on household size or labor force, and a second or third child provides another productive worker. These developments suggest that while labor will likely continue to be abundant in rural areas, a labor shortage may occur in urban areas in the 1990s if the present restrictions on population movement are not changed (in fact some liberalization of rural-urban migration rules has already occurred to permit peasants to work in small towns).

1.13 The implementation of China's education policies needs to be seen in the context of these developments in other sectors. This annex analyzes selected trends in education and discusses the impact of some external factors on education since the first report was written in 1981. It focuses on education subsectors and issues that were either not sufficiently covered in the

1981 report or not known at that time. It reviews quantitative education developments with the perspective of the Government's policies and the population data obtained from the recent census.

1.14 Specifically, this annex first discusses the proposed introduction of a universal, nine-year basic education system. Secondly, it deals with the kinds of technical/vocational education offered outside the universities. Thirdly, it looks at the demand for and supply of staff in primary and secondary education and issues related to the training of teachers. The annex concludes with a review of the costs and financial issues in education.

2. UNIVERSALIZATION OF BASIC EDUCATION

2.01 The Government of China has repeatedly stressed its policy of "popularizing" primary education, i.e. making it universal. The Government also aims to make lower secondary education universal in urban areas by 1990 and nationwide by the year 2000. This in effect would introduce a universal nine-year basic education system similar to those in many developed countries. Moreover, the Government aims to make upper secondary education universal in urban areas by the year 2000, but has set no date for rural areas.

2.02 These targets will have a far-reaching impact on the primary and secondary education system. After significant expansion of both levels of education from 1949 onwards, enrollments have begun to decline in recent years, because of both lower intake and higher dropout rates. Staffing levels have not decreased commensurate with drops in enrollment, thus exacerbating inefficiencies in staff utilization. To improve school quality selectively, the K-school philosophy was reintroduced in the late 1970s, but a reaction against this policy has recently occurred. These existing problem areas in the two levels of basic education will need to be considered in light of the changes now proposed. The remainder of this chapter thus first describes in more detail the recent developments in basic education noted above. It then considers what implications these issues in basic education have for the universalization strategy and how they might be tackled as part of this strategy. The chapter concludes with a brief review of prospects for achieving the Government's goals in basic education by the year 2000.

Recent Developments in Primary and Secondary Education

(a) Enrollment Trends

2.03 Primary education expanded rapidly after 1949: enrollment, at 24 million students in 1949, had reached 136 million by 1983. The estimated

net enrollment ratio [2/] was 25% in 1949 and, by government estimates, about 90% in 1983. The latter ratio is high for a country at China's stage of development and compares well with the average 68% enrollment ratio for the 6-11 age group in the rest of the developing world (Appendix A2). During the last 30 years, adult literacy in China has improved from some 20% of the population in 1949 to over 70% in 1983. The latter rate is also impressive and compares with a developing country median of 50-55%.

2.04 A closer look at recent enrollment figures nevertheless reveals some negative developments (Appendix B, Tables 8 and 10). Absolute enrollment in formal primary education peaked at 151 million students in 1975 and has thereafter declined by about 15 million students. It was estimated that the net primary school enrollment ratio might have been higher than 90% in the mid-1970s. The ratio leveled out in the late 1970s, and declined during the first few years after the introduction of the peasant responsibility system, and has apparently begun to increase again. Enrollment in spare-time primary education for adults and teenagers who never completed their primary education went down from 21 million in 1979 to 8 million in 1983.

2.05 There remains, furthermore, a regional enrollment gap. Although close to 90% of all children in China enter primary schools, only one out of four counties has achieved universal primary education. These are concentrated in cities. There is thus an enrollment gap between urban and rural areas, where some 80% of the population lives and where most Chinese will continue to live at least until the end of this century. Just as serious are the disparities in educational enrollment among different rural localities. In some poor areas, school attendance appears to be unsatisfactorily low, especially among girls - and significantly lower than official enrollment data suggest. Although enrollment statistics in all countries overstate actual attendance, and although it is not possible to assess the impact of such overstatement on China's overall enrollment ratio, measures to improve the accuracy of the statistics collected could assist in formulating appropriate policies.

2.06 An estimate of dropout rates in primary education can be made from the enrollment statistics by grade (Appendix B, Table 1.1). The exact percentage of full year repeaters is not known but is comparatively low in all grades, with the possible exception of the final (examination) grade. By contrast dropout rates are high. On average, one student out of ten drops out between each grade. This implies that only 65% of the students who commence Grade 1 will be in Grade 5 five years later. Most of the other 35% will have left school. The dropout rate for Grade 1 is particularly serious. Many rural students apparently start primary school but drop out after a few months, possibly to re-enroll in Grade 1 for the next academic year. Statistics further show that 10-15% of Grade 5 students do not graduate. The flow chart (Appendix B, Table 1.1) showing the progress of primary school pupils in 1979-83 thus verifies the Chinese Government's "9-6-3" statement, i.e. that 9 out of 10 children commence primary education, 6 complete it and only 3 graduate

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2/ The net ratio excludes, but the gross ratio includes, under- and over-age students.

i.e. that 9 out of 10 children commence primary education, 6 complete it and only 3 graduate with good performance. Understandably this waste of human resources is a cause for concern.[3/]

2.07 If not improved, the current enrollment situation may well cause the Chinese literacy rate to stagnate around 70%. Good literacy in Chinese, a major aim of China's primary education, is said to require five years of schooling. If this is true, only two out of three Chinese children who enter primary school will eventually become literate, i.e. the two who complete five years of education. The current literacy rate would only improve to the extent that literacy courses are organized for school dropouts, for those who never enrolled and for illiterate adults. These courses have played an important role in China over the last decades and had enrollments of 5.3 million students in 1983. Experience worldwide indicates, however, that the formal education of children is more efficient than the nonformal education of adults and teenagers in achieving permanent literacy.

2.08 Development of China's formal secondary education since 1949 has in some ways been even more impressive than that of primary education (Annex B, Table 10). In 1949, secondary schools enrolled about 1.3 million students, corresponding to a gross enrollment ratio of only 2%. Enrollment had grown to 68 million by 1977, with a gross enrollment ratio of about 46% based on Bank estimates of the size of the corresponding population groups. The latter ratio compares favorably with the 35% average enrollment ratio for developing countries.

2.09 The enrollment trend over the past few years has been less favorable. Overall enrollment for formal secondary education (i.e. including both lower and upper secondary schools) has decreased from a peak of 68 million pupils in 1977 to 46 million in 1983, i.e. a decline of 32% or 22 million pupils. This corresponds to a large decline in the gross enrollment ratio (to approximately 30%).[4/] During the same period the developing country average increased to 39% and that of the advanced countries to 83%.

2.10 Enrollment decreases over the last few years have been similar at the lower and upper secondary levels. In 1979, lower secondary education enrolled 46 million students, which corresponds to a 63% gross enrollment ratio for the 12-14 year age group, based on current World Bank estimates of China's population. Enrollment decreased to 38 million students in 1983, or 46% of the relevant age group, i.e. a reduction in the enrollment ratio of 17%.

3/ China's primary school pupils nonetheless perform better than primary school children of the same age in LDCs with the same income level, where completion rates are often below 50%.

4/ 34% if students in extended primary schools at the lower secondary level are included.

2.11 In upper secondary education, the ongoing conversion from a two-year to a three-year system has not prevented a dramatic decrease in total enrollments. Enrollment in all formal upper secondary education (including technical and skilled worker training schools, and primary teacher training schools) was 14 million in 1979, corresponding to 36% of the 15-16 year age group; in 1983, enrollment had been almost halved to 8 million students, or 16% of that age group (or only 10% if the three-year age group, 15-17 years, is taken).

2.12 Intake of new students has declined and dropout rates have gone up during the last four years. Enrollment in lower secondary Grade 1 was 18 million in 1979 but declined to 14 million in 1983. The transition rate from primary to lower secondary education went down from 83% in 1979 to 65% in 1983. Since available data indicate no major changes in the size of the relevant age group during this period, the decrease must reflect a reduction in the number of primary school graduates applying for further education. The decrease is said to have taken place primarily in rural areas. Dropout rates between grades have continued to be high, averaging 12% between Grades 1 and 2, and 22% between Grades 2 and 3 during 1979-83. At the upper secondary level, the intake of new students declined from 7 million in 1979 to less than half that figure in 1983. The transition rate from lower secondary to all types of upper secondary schools was 37% in 1979 but decreased to 24% in 1983. A reduced intake to general upper secondary education reflects (in contrast to the situation at the lower levels) at least partially the Government's policy of diverting students from academic to technical/vocational fields, thereby reducing pressure for university places. The intake of technical schools of different kinds has, however, not yet increased enough to compensate for the drop in the intake to general upper secondary schools. The few data available indicate that dropout is less of a problem in upper secondary education than in primary and lower secondary education, averaging 9% between grades during 1979-83. Failure rates in the final examinations are about 10% or less.

2.13 During this period of decline in formal secondary school enrollments, enrollment in nonformal secondary education has increased from 4.7 million to 9.6 million (1982). But the 4.9 million increase in nonformal secondary enrollments was not sufficient to offset the 22 million decline in formal enrollments during 1977-82. Moreover, the nonformal system caters primarily to young adult workers (to make up for missed educational opportunities during the Cultural Revolution), rather than providing additional skilled labor. It is, in addition, generally more costly to provide secondary education to adults than to teenagers, because of income foregone and other economic factors. Thus China's well-developed system of nonformal, in-service secondary education can compensate for lost educational opportunities and upgrade the labor force, but it can only partially substitute for a well-developed, formal, preservice system.

(b) Staff Utilization

2.14 In view of declining enrollments, efficiency in teaching staff utilization has worsened at both the primary and secondary levels. Primary school teaching staff has increased slightly while enrollment declined by

11 million students during 1979-83. The student/teacher ratio has consequently gone down from 27:1 in 1979 to 25:1 in 1983 (the median ratio for other LDCs is about 35:1). The class size has been kept almost constant, at around 34, which implies that teachers' weekly workload - by international standards, already a low 20 periods - has gone down further. The number of full-time administrative staff has also increased by 28% (to over 0.6 million) despite a 6% reduction in the number of primary schools.

2.15 Similarly, at the secondary level, while enrollments in lower secondary education decreased by over 17% during 1979-83, teaching staff only decreased by 10%, which implies that the student/teacher ratio decreased from 19.2:1 to 17.6:1. In general upper secondary schools, enrollments were roughly halved, while teachers declined by only 21%, and the student/teacher ratio consequently decreased from 19.4:1 to 13.9:1. Similar developments reduced the ratios in primary teacher training from 14.0:1 to 11.3:1, in technical schools from 8.6:1 to 5.9:1 and in skilled worker training schools from 11.6:1 to 6.2:1. These ratios might be compared with a median of 21:1 in other developing countries. As in primary education, these low ratios are caused not by small classes but by low teacher workloads, which average 10-12 periods/week (20-25 periods/week are common in advanced countries [5/]).

2.16 Low student/teacher ratios could be justified if they were proven to improve teaching. In fact larger workloads with fewer, but better-qualified, teachers [6/] might enhance teaching in China despite comparatively large class sizes. Relative staff increases at all levels of basic education are therefore difficult to justify from a pedagogical or from a financial point of view.

(c) The K-School Philosophy

2.17 The rapid expansion of primary and secondary education in China in the late 1960s and early 1970s led to a serious deterioration in school quality. Many teachers were unqualified and many schools lacked facilities and equipment for even basic teaching; this situation persists today. During the late 1970s, the Government considered it necessary to take drastic measures to improve school quality by providing better inputs to the system. As it was financially impossible to do this nationwide, it was done selectively, by reintroducing the K-school concept. A few schools in each province and county were designated as K-primary and secondary schools; they were allocated extra funds (their funding was 2-3 times that of regular schools) and provided with better facilities, didactic materials and teachers. K-schools enrolled the best students and through rigorous efforts by the staff provided them with an excellent education. The K-schools set standards for other schools but

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5/ A survey in one European country showed that its teachers had among the lowest annual workloads of public employees despite a weekly load of 21-30 periods.

6/ The proportion of unqualified teachers is said to be 40-50% in primary schools, 70% in lower secondary schools and 40% in upper secondary schools.

mainly prepare their students for further education (the K-schools can almost guarantee their students eventual entrance to institutions at the next level of education) and could, for example, offer instruction in foreign languages, which because of teacher shortages may not always be possible in regular schools.

2.18 Some regular schools applied the K-school philosophy by opening K-classes. This development led to an overemphasis on preparing students for further education and on the performance of the most able students. Insufficient attention was paid to preparing less able students for adult life, so that average or below average students lost interest in their schooling. The gap between high and low performers increased. By the early 1980s this led to a reaction against the most extreme application of the K-school concept and some of the more negative consequences at the lower education levels have been eliminated. Intraschool streaming and establishment of K-classes have now been stopped. Moreover, student intake to K-schools has been localized and student catchment areas have been reduced. Through administrative action supported by provincial education bureaus under MOE, the K-school concept is being redefined as a vehicle for diffusion of improved curricula, materials and teaching practices to local schools. K-schools now comprise 1% of primary and about 4% of secondary schools; K-students may amount to 5% of all students at the primary and secondary levels (counting both K-schools and K-classes).

Issues for Basic Education Strategy

2.19 Introduction of a nine-year system of basic education poses problems in light of the recent developments in primary and secondary education discussed above. A fundamental question, however, concerns the aims of universal education in China and the best means of achieving them. Continued concern and remedial action with respect to enrollments and dropout rates is required. If the recent pattern of a decline in school attendance that followed in the wake of the reforms in the rural economy were to persist, this could seriously imperil efforts to universalize basic education. (The related problem of increasingly inefficient staff utilization is considered in depth in Chapter 4, which assesses the future demand for and supply of teachers in basic education). A second issue concerns the role of the K-schools and their appropriateness in a nine-year basic education system. Finally, implementation of the Government's basic education strategy poses several management problems. These issues are discussed below.

(a) Aims of Basic Education

2.20 In China, as in most other developing and developed countries, basic education has two major objectives. It should first educate the majority of pupils for adulthood and their life in society. It might be the only, and therefore terminal, formal education for most pupils, who are mainly the children of farmers and of unskilled workers in industry and the service sector. Appropriate mastery of speech, reading and writing of the mother tongue and a competent handling of basic mathematics have been the cognitive skills that basic education has inculcated into pupils. The socializing task is also important and includes familiarization with behavior and beliefs that society considers important. Second, basic education should also prepare able

students for further studies at the secondary level, and possibly in universities, and eventually for leading roles in their communities.

2.21 It has frequently proven difficult to arrive at a reasonable balance in these two objectives. Countries have attempted to achieve the dual objectives of basic education in different ways. Some have favored offering students study electives during the last few years of basic schooling. Students not interested in further education can take less demanding courses (e.g. an easier course in mathematics) or even drop subjects (such as foreign languages), and also choose prevocational subjects. Students wanting to pursue further education can focus on purely academic courses. This type of system seeks to group students by their objectives rather than their ability, but is nevertheless believed to lead to ability streaming. It is claimed that no study program in a basic education system should be terminal, but all programs should allow students to pursue further education, if necessary with remedial or preparatory programs.

2.22 A basic question concerns the ultimate disposition of lower secondary school graduates. The transition rate from lower to upper secondary education has decreased during the last few years (para. 2.12). Thus the percentage of lower secondary graduates entering the labor market with no job training is increasing, and universalization of lower secondary education is likely to accentuate this trend.

2.23 Similarly, as universal education is extended, even partially, to the upper secondary level, the appropriateness of the present academic emphasis of secondary education will need to be reviewed.[7/] At this level, preparation for the university entrance examination has been a high priority, as shown, for instance, in the introduction of a three-year curriculum. This has led to an overemphasis on examinations and on subjects examined for university entrance. Students who enter university are reasonably well prepared for advanced studies, at least in natural sciences and in engineering, but they comprise only a small minority of all academic secondary school graduates (10-15%). As a second best choice, another 10-15% of graduates enter postsecondary technical schools. The remaining 70-80% of graduates leave school with a general education but no other job preparation.

2.24 The Government is therefore faced with the need to provide graduates with training to benefit society and the country's development, but it cannot meet the educational and vocational aspirations of all students. It is seeking the structures, curricula and selection methods that would best achieve a reasonable balance between the demand for and supply of secondary education and minimize pressures for further education. A vocationalization

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7/ Only some 20% of upper secondary school students in China are in technical/vocational education, compared to 40-50% in some advanced and newly industrialized countries.

program [8] for upper secondary education represents the Government's major initiative in response to this issue. The program will be discussed in Chapter 3.

(b) Demand for Basic Education

2.25 As noted earlier (paras. 2.04 and 2.09), the decline in enrollments, that continues most clearly at the lower secondary level, may make the Government's targets for universal education difficult to reach. They could delay the achievement of full literacy and, in the wider perspective, jeopardize achievement of the four modernizations. A better understanding is needed of the factors that have contributed to the recent decline in enrollments, part of which is due to traditional attitudes about the value of education and part to policies in other economic sectors. The Government has taken action to reverse the present trend, and further actions that could make basic education more attractive and promote attendance are also described below.

2.26 Successful primary education can lead to further education and eventually to a socially and economically better life, and this continues to be a powerful reason why poor peasants and people from other economically deprived groups accept great sacrifices to send their offspring to school. In this respect poor people in China differ in no way from those in other countries. But while education is perceived as a way to a different and presumably better life, the current stratification - in access to and in the quality and goals of basic education in China - may serve as a disincentive to attendance for those at the bottom of the system, i.e. in the rural areas. (Student performance, rather than attendance, is the main concern for city schools). The occupational rigidity and geographic immobility of Chinese citizens, particularly in rural areas, further reduce educational choices. Primary schools are a local responsibility and a family is limited to the schooling available locally. Rural parents are generally well aware of the limited opportunities for their children to advance to further education and may see little use in their children attending a primary school with this aim.

2.27 Implementation of the agricultural responsibility system (paras. 1.08-09) has further reduced the holding power of many rural primary schools. Under this system, more farm work and increased production directly increase family incomes, so many rural parents prefer to have their children work on the farm or in the household rather than go to school. The responsibility system,[9] which in itself is sound, has unintentionally reinforced the perception common in rural areas of LDCs that the income foregone in sending

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8/ Under this program, some general upper secondary schools will offer classes in technical/vocational subjects, while maintaining programs in academic subjects, and others will be fully converted into "vocationalized" secondary schools that offer only technical/vocational programs.

9/ The negative impact of this system on the quality and motivation of locally hired teachers, together with ways of reversing these developments, is discussed in paras. 4.35-37 below.

children to school - instead of having them tend domestic animals, do simple work in the fields or just look after younger children - is not compensated by possible future income increases because of literacy and numeracy. Another disincentive is the direct cost of education. Students usually pay a few yuan per semester for textbooks and tuition. Some especially poor students may be exempted. This may seem like a minor cost, but many parents, particularly in poor rural areas, may feel that it is more than they can afford and not worth the investment. Moreover, fees in some areas have apparently recently increased as a result of increased local financial self-reliance in basic education.

2.28 Physical inaccessibility is also a constraint to universalization of basic education. Many areas in China are densely populated, so that schools are close to children's homes and easily accessible. But in other areas - not just in the North or Northwest - students would have to walk long distances to get to school. A long distance between home and school has been found to be a serious deterrent to school attendance worldwide. Since 1979 the Government has closed some 58,000 primary and 47,000 secondary schools primarily because of their low quality. These closures have probably increased school inaccessibility in many places.

2.29 Recent Government Actions. The Government, through the information units at the township level, is trying to popularize education and relay findings about its profitability and other benefits. Research in other countries on the value of education has concluded that literate farmers are more productive farmers and more efficient in the management of farm resources. A prime factor in increased productivity is that educated farmers tend to be more willing to adopt new inputs and to use them more efficiently. On average, farm production is said to increase by about 9% as a result of a farmer having completed four years of primary education rather than having no schooling. Moreover, farmers with a secondary education appear to do even better under the new responsibility system than those with only a primary education. Other studies have indicated that education also affects in other ways the well-being of society as a whole. Literacy among females can have a positive influence on infant and child mortality, as well as on children's nutritional status. It can also affect fertility, by changing demand for children and contraceptive acceptance. In addition, children of better educated mothers generally perform better in school.

2.30 The Government has also attempted to promote school attendance by allowing class schedules and academic years to be changed to accommodate the employment needs of the agricultural seasons. School holidays have been moved and school days shortened. Spare-time primary schools have been established and itinerant teachers hired. (These teachers serve mountain villages with few children, by holding classes during a morning shift in one village and an afternoon shift in another.) Some counties report that these measures have increased enrollment. (See also para. 2.39.)

2.31 For some time, the Government has been considering making attendance at primary schools mandatory. Policies to make education compulsory were adopted by the industrialized countries early in the development of universal basic education; similar policies were adopted by many developing countries in

the 1960s and 1970s. These have met with varying success, depending largely on the methods and effort of enforcement. In China, a policy of mandatory completion of primary education has already been adopted by Jiangsu Province; parents must pay a fine if their children are not allowed to complete primary education.[10/] In general, however, enforcement is likely to be less of a problem in China than in other countries, because social pressure can play a large part in instituting government policy.

2.32 Possible Additional Measures. In poorer areas, more financial support from higher levels of government, including the central government, will be essential to improve enrollment and educational quality. Parents in these areas cannot afford to pay large enough fees. Nor can township and village governments cover the costs involved from their limited revenues, particularly because in poor localities there are comparatively few township and village enterprises. In richer areas, the present trend of increased financial self-sufficiency in basic education is defensible. But in poorer areas, this trend is aggravating educational disparities that are already unacceptably large. More generally, the learning environment in rural primary and lower secondary schools could be improved to increase their attractiveness. The gap in the amount and quality of facilities available to rural and urban schools could be reduced through improvements in the quality of textbooks, supply of additional didactic materials, and improvement of the physical classroom environment. However it would not be feasible or desirable to supply rural schools with sophisticated learning equipment and communication systems. (Forty percent of China's population, mostly in rural areas, have no access to electricity, which would prevent effective use of some contemporary teaching methods.)

2.33 More could also be done to improve school accessibility and reduce the distance between a student's home and his school. Wider use might be made of multigrade teaching, whereby a school's student catchment area could be several times smaller than it would be under a single grade system. This would be economically feasible in areas in China with only 5-10 students in each age group within a one hour commuting distance. A system of biennial rather than annual student intake might also be feasible in China's remote areas. The system of itinerant teachers was found to be taxing on the teachers in European countries that used this scheme in the past. In locations where the population is even thinner or nomadic, a boarding school system would seem to be the only feasible solution. Research in other societies has shown that the above measures do not necessarily reduce the quality of learning. Students in rural multigrade classes have performed as well as students in traditional single grade classes, and in some regards (e.g. social adjustment) have done better.

2.34 It has been suggested that introduction of special subjects in the curriculum of rural basic schools in China might make schooling more relevant,

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10/ China Daily, June 29, 1984.

and presumably more attractive. In other countries,[11] this has been done by combining teaching of academic subjects with, for instance, work in fields and gardens and carpentry. It was believed that this type of diversified basic education would be more relevant for adult life (i.e. for those not continuing their education) and help convince parents of the economic value of schooling.

2.35 The introduction of "special" or "practical" subjects in basic schools, and of separate programs for those who would enter the labor market and for those who would continue their education, has seldom achieved its objectives when tried in other countries. The specialized programs have not made basic schooling more attractive and the schools have seldom been able to provide training "of relevance."[12] Moreover, the teaching of practical subjects has not made the academically inclined more appreciative of manual skills, nor has it made rural life more attractive to city dwellers. The programs have, in most countries, been unfair to those coming from the peasant and worker classes or from other disadvantaged groups. They have, furthermore, reduced the possibility of identifying and developing a pool of able pupils from disadvantaged groups, as these children have almost invariably been relegated to the less demanding programs, regardless of their academic potential.

2.36 While the above paragraphs discuss some reasons for the school enrollment decline and possible means of dealing with the issue, this question deserves a more comprehensive study. A study of the situation, its causes and possible remedies could be undertaken by the Central Institute for Education Research, which conducts research for the Ministry of Education.

(c) Application of the K-School Concept

2.37 The role and effectiveness of the K-schools vary by education level, as well as by the location of these schools in urban and rural areas. Continued application of the K-school concept as part of a basic education strategy raises one general issue - equity/equality - and one specific issue, namely its role in the universalization of basic education. The former issue is relevant because it heightens the quality and access gap between rural and urban areas. The latter issue needs to be considered for each level of education.

11/ Attempts to "vocationalize" primary education have been common in developing countries where universal primary education has been considered a necessity, but the percentage of students who would pursue further education has been small.

12/ It is claimed that when countries can afford a universal nine-year basic education system, the economy is so developed that the content and quality of prevocational subjects that can reasonably be offered to students 13-15 years of age are of limited use in the adult working community. Under any circumstances these subjects need to be followed by additional vocational training or apprenticeship schemes.

2.38 Effect on Equity and Equality. A considerable gap exists between the quality of rural and urban schools. Urban primary schools are state schools, whose teachers are paid by the Government; they are reasonably well supplied with facilities and materials. Rural schools on the other hand are now the responsibility of the townships, which cover most capital and recurrent costs. Despite a state subsidy for their locally hired teachers, rural communes are having difficulty providing competent and dedicated teachers in the face of more rewarding jobs in the community (paras. 4.35-37). Textbooks are available at all schools, but rural schools often lack appropriate and safe buildings, furniture and other didactic materials. Most K-schools are in urban areas. They receive more funds and as a consequence the urban-rural gap has widened.

2.39 Although urban and rural schools offer basically the same curriculum, rural schools may adjust the curriculum to local conditions, by offering education full-time, half-time, spare-time, in the slack season or winter, and at other times (para. 2.30). Urban schools and K-schools on the other hand are almost invariably six-day, full-time primary schools. The flexibility of rural schools is an asset in many ways, but also a potential liability: attendance may be irregular, which has negative consequences for learning.

2.40 Discussion of the equity/equality issue has, as mentioned, already occasioned some changes in application of the K-school concept. The neighborhood has been made the catchment area for urban K-schools in an attempt to reduce inequality. China's housing policy, which sometimes concentrates professionals and cadres in some urban areas and blue-collar workers in other areas, could, however, reduce the impact of this policy. Another change is the abolition of entrance examinations for K-primary schools. But again this may, depending on the type of examination, reduce the chances of gifted children of blue-collar workers entering these schools. Thus in general it seems that urban schools, reinforced by the K-school system, prepare their students for further education and high level jobs, while rural schools prepare their students for adult life and manual, lower skill jobs.

2.41 Impact on Universalization Strategy. Despite recent decreases, the ratios for primary and lower secondary education could be above 90% after several years. Such high enrollment in lower secondary education will require a system that offers equal educational opportunities to all at the primary level. There is therefore reason for the Chinese authorities to consider a unified primary education system (without K-schools) that is seen as a basis for the further education of all citizens, from both rural and urban areas. The complete abolition of K-schools at the primary level has in fact recently been discussed. Application of the K-school concept at the lower secondary level might exclude bright students from further education and ultimately from a career that benefits society, because of their family background or late maturation. The risk of not identifying or fully developing talented youngsters is thus increased once a highly structured system of regular and K-schools is extended to nine years. Furthermore, studies of European systems in the 1950s and 1960s showed that less able students at this level lost more from not being taught in classes together with brighter pupils than brighter

students gained from being taught in homogeneous, high ability classes. These findings suggest that application of the K-school concept, even just at the upper part of a nine-year system of universal basic education, would be wasteful both in economic and social terms over the medium and long run.

2.42 K-schools at the upper secondary level, i.e. beyond the basic education system, present less of an issue because of the more important role this level of education plays in preparing students for further education. It is easier to identify able students at the end of their adolescence with tests that emphasize aptitude (rather than knowledge acquired through schooling) and that have some predictive value. It is, moreover, necessary to screen students for progression from a universal lower secondary system to selective academic upper secondary education. An upper secondary K-school system would therefore not necessarily be harmful. The composition of the student body in K-upper secondary schools would need to be continuously studied, however, and possible imbalances (e.g. in representation by sex or minority groups [13]) could be corrected through quota systems.

(d) Management Issues

2.43 Efficient management of the system is hampered by a lack of data in several areas. The condition of physical facilities is often known mainly through anecdotal evidence or through rough aggregate estimates. The actual supply of important inputs for learning, such as libraries and science equipment, is not known. It is thus not possible to assess the performance of the system satisfactorily as measured by inputs - and even less as measured by outputs (a review of examination papers and results provides some information, but this is of limited usefulness).[14] There are, furthermore, insufficient data available to assess quantitatively the equity of China's education system. The rural-urban disparity has probably increased recently, but the magnitude of this disparity is not yet known.

2.44 Much time-consuming work is needed in several areas if the universal nine-year basic education system is to make the required contribution to China's economic and social development. A complete analysis of China's basic education system would require: (a) a survey of physical facilities; (b) an IEA-type study; and (c) a provincial or even prefectural breakdown of school enrollments by grade, sex, ethnic group, and rural/urban residence as related to age group and the composition and distribution of the population. This information is only partially available. The work under (a)-(c) above could

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13/ Differences in language, culture and economic development may discriminate against students from minority ethnic groups however carefully the examination tests are developed and evaluated.

14/ Studies to measure student achievement, similar to those conducted under programs of the International Association for the Evaluation of Education Achievement (IEA), would be more useful. This type of study relates inputs to outputs and allows education decision-makers to compare alternative scenarios and take appropriate corrective actions.

be joint research projects carried out by the Central Institute for Education Research and Chinese universities, possibly in cooperation with the International Institute for Educational Planning. A thorough study of the enrollment trend in primary and secondary education could be undertaken by the Central Institute for Education Research (para. 2.36). In addition, the Government needs to consider the implications of its policy in such areas as curriculum development and teaching methods, examinations and evaluation, promotion policy and planning of physical facilities. These aspects of management are discussed below.

2.45 Curriculum and Teaching. Universalizing nine years of basic schooling would require curricula revisions and research on course content and teaching methods, particularly at the lower secondary level. This is because the learning situation in a school changes considerably when it is to meet the learning needs of the total adolescent population (many of whom will not go on to higher education) rather than those of a minority who will pursue their education further. Course content and learning methods need to change accordingly. Experience from OECD countries indicates that considerable time and effort are needed to develop curricula and to conduct research on course content and teaching methods.

2.46 Examinations and Evaluation. Appropriate testing, examination, and evaluation methods must also be created for a basic education system. They must be suitable for the whole population group, not just the few students continuing to upper secondary and university education. Standardized tests that help teachers and administrators assess the quality of the system rather than the performance of individual students might be developed. They could partially replace or supplement the current comprehensive examination systems at the end of primary and lower secondary education.[15/]

2.47 Promotion Policy. Promotion policy in basic education is an issue in some countries. It is claimed that grade repetition [16/] in a universal school system may reflect more the competence of the teacher than the potential and performance of the student, and therefore it should not be supported. Rather, students should be given remedial teaching in the subject they failed and not be forced to repeat a year in all subjects. Others claim that automatic promotion with or without remedial teaching has a negative impact on overall school performance, and that grade repetition is therefore a necessity. It may be said that there is not enough evidence to support the latter view. The threat of repetition does not seem to increase the incentive to study among children in this age group. (Other more constructive factors such as parental support, teacher effectiveness and textbook supply appear more important for good performance). Repeating a year in all subjects does

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15/ The Ministry of Education has recently suggested that examinations at the end of primary education be abolished in urban areas.

16/ In fact repetition in Chinese primary schools appears to be quite low for most grades; more serious is the problem of dropouts from Grade 1 who re-enroll for the next academic year (para. 2.06).

not seem to improve a student's knowledge and skills enough to justify the extra cost to him and society. It may lower the overall quality and cost effectiveness of the system.

2.48 Planning of Physical Facilities. A 5-6 year primary education system only requires classrooms and some simple administration and storage areas. The addition of three more school years to establish a nine-year system of basic education implies inclusion in the curriculum of subjects such as physics, chemistry and biology, which even if taught jointly as "science" require some special facilities and equipment. These requirements and those caused by the introduction of "practical subjects" originally led authorities in many countries to construct "nuclear schools" or "central schools" in towns, townships or major villages, so that the student catchment area was sufficient to justify economically and fully utilize the special facilities (laboratories and workshops). In sparsely populated areas, students had to board or travel long distances to school. The larger size of these schools also allowed them to hire the specialized teaching staff they considered necessary for science and "practical" subjects.

2.49 The need to provide special rooms and teachers in basic education schools has, however, been questioned, as has the concept of central schools with their large catchment areas. During the last few decades, didactic science materials have been developed for basic education that can be efficiently used without laboratories and do not even require that schools be electrified. Contrary to previous beliefs, the difference in achievement at these education levels between students who have access to laboratories and those who do not appears comparatively small. Under World Bank projects in many countries involving science and "practical" education, schools in remote and poor areas have, furthermore, had difficulty in running and maintaining laboratories and other more sophisticated facilities (including equipment such as tape recorders and overhead projectors). Teacher training in many developed societies has also become less specialized, so that teachers can teach at least three subjects in the upper basic education grades (7-9) satisfactorily. (Some LDC research indicates also that a high degree of teacher specialization does not guarantee high instructional performance at this education level.) Student transportation and boarding have also been found to be expensive and often complicated. In some countries, arguments are therefore now being made to revert to smaller neighborhood schools throughout the basic education system, even if these schools are less well endowed with facilities and specialized staff.

2.50 Extension of basic education to nine years in China will require thorough forward planning. Variations in population distribution and composition, demographic trends, migration patterns, urbanization, topography, climate and transportation means are considerable in China. Rigid rules on school location, size and physical facilities should therefore be avoided and much attention given to local conditions and means. There is, nevertheless, a large need for "school mapping" at the county, prefecture and municipality level. The experiences of the International Institute for Educational Planning (IIEP) in Paris could be of great use to Chinese authorities in this respect. Moreover, the introduction of universal lower secondary education, when seen as part of a unified, nine-year basic education system, need not

necessarily require huge investments in buildings, equipment and specialized teaching staff (para. 5.14).

Prospects to the Year 2000

2.51 Primary Level. The World Bank has made projections of future enrollments in primary education and the impact on teacher demand and education costs.[17] If available demographic data are correct, the number of seven year-olds, the entry age for primary education, and of all children in the primary school age group would decline almost every year until the end of the century because of the fertility decline. Primary school enrollments would therefore continue to decline even as primary education becomes universal. This decline will facilitate achievement of universal primary education because the demand for classrooms and teachers will also decline. Reintroduction of a six-year primary education system nationwide could be accelerated. It has been assumed that primary education would be universal by 1992 and that the current completion rate of about 65% would improve to 95%. All schools would have converted to a six-year system by the year 2000. Under these assumptions, primary school enrollment would continue to decline from 136 million in 1983 to 99 million in 1990 and then level out at around 95 million students during the late 1990s (Table 2.1).

Table 2.1: PROJECTION OF PRIMARY STUDENT ENROLLMENTS, 1983-2000

Year	Total enrollment (mln)	Population age 7-12 (mln)	Gross enrollment ratio
1983	136	144	0.94
1985	124	130	0.95
1990	99	111	0.89
1995	88	91	0.97
2000	94	94	1.00

Source: World Bank estimates.

2.52 Based on the World Bank's preliminary projections, it should be possible for China to achieve universal primary education with qualified teachers,[18] a reasonable supply of didactic materials and a good physical school environment. The prospects for a high quality of education in China by

17/ The projections are based on partial census data available as of early 1984.

18/ The supply of teachers is dealt with in Chapter 4.

the year 2000 are good, and the country would not face the constraints of manpower and finances that have beset most other developing countries trying to universalize primary education.

2.53 Secondary Level. The World Bank has also made projections of enrollment in lower and upper secondary education for the period 1983-2000, again using available demographic data and assumptions derived from current government policies. The projections (Table 2.2) show that the current student enrollment in lower secondary education would gradually increase from 38 million in 1983 to a peak of 48 million in 1988 (this is still below the peak of the mid-1970s). Because of demographic developments, enrollment would decrease during 1989-92 to 39 million. Enrollment fluctuates between 39 and 43 million until the end of the century, when enrollment of 42 million corresponds to universal enrollment. The Government should be able to achieve its goal of universal lower secondary education, and thus of nine-years' universal basic education, without serious financial or staffing problems because of favorable demographic developments.

Table 2.2: PROJECTION OF STUDENT ENROLLMENTS AT THE LOWER SECONDARY LEVEL, 1983-2000

Year	Total enrollment (mln)	Population age 12-14 (mln)	Population age 13-14 (mln)	Gross enrollment ratio
1983	38	83	81	0.44
1985	41	77	79	0.51
1988	48	66	70	0.61
1990	45	59	61	0.73
1992	39	56	57	0.76
1995	43	54	55	0.79
2000	42	45	43	0.92

Source: World Bank estimates.

2.54 It was assumed that universalization of upper secondary education in urban areas by the year 2000 would be accompanied by a gross enrollment ratio of about 30% in rural areas and 55-60% nationwide, up from the current 10%. This would equal recent ratios at this education level in Europe. The Government has examined the possibility of vocationalizing upper secondary education by 1990 (para. 2.24), which implies that half of all upper secondary students would be in some type of technical/vocational education program (e.g. in industry, agriculture, social services, commerce or teacher training) by that time. The current system, under which about half the academic students are in 2-year courses and half in 3-year courses, would eventually be replaced by a system offering only a 3-year option. Intergrade promotion rates in upper secondary schools are high at 98%, and are assumed to remain so. World Bank projections (Table 2.3) show that total upper secondary school enrollment

(general and technical/vocational) would increase from the current 7 million students to 19 million in 1988. It would then level out at 20 million in 1989-92 before slowly increasing to 29-30 million students by the end of the century. The number of students in technical or vocational programs would increase from the current 2 million to 14-15 million (from 20% to 50% of the total at this level).

Table 2.3: PROJECTION OF STUDENT ENROLLMENTS AT THE UPPER SECONDARY LEVEL, 1983-2000 /a

Year	Total enrollment (mln)	% technical/ vocational students	Number of technical/ vocational students (mln)	Population age 15-17 (mln)	Population age 16-18 (mln)	Gross enrollment ratio
1983	7	27	2	73	73	0.10
1985	12	34	4	81	77	0.16
1988	19	44	8	77	79	0.22
1990	20	50	10	70	74	0.29
1995	23	50	11	56	57	0.46
2000	29	50	14	45	51	0.56

/a Upper secondary students include those in general upper secondary schools, vocationalized secondary schools, technical schools and skilled worker training schools.

Source: World Bank estimates.

2.55 The current secondary school projections and those done for the 1981 Economic Report were both based on stated government plans; a comparison shows that the overall enrollment targets have been lowered somewhat and are more realistic. Total secondary enrollments in 1990 would, under the current assumptions, rise to 65 million students, versus 71 million in the 1980 projection. This 8% reduction will facilitate implementation of the Government's program and the supply of teachers.[19] Capital investments for technical/vocational education would, however, become very large, as already indicated in the 1981 report and discussed below.

19/ Projections of the supply of teachers are dealt with in Chapter 4.

3. TECHNICAL AND VOCATIONAL EDUCATION

3.01 Formal technical/vocational education after 1949 followed the Soviet model. It originally comprised two basic types of schools:

(a) technical schools, often referred to as specialist schools, which train middle-level technicians through a mixture of 2-5 year courses at the upper secondary and postsecondary levels; and

(b) skilled worker training schools, which offer mostly 3-year technical/vocational courses at the upper secondary level.

The Government subsequently introduced a third type of formal technical/vocational education (para. 2.24) by giving such training:

(c) in classes at upper secondary schools that otherwise still offer academic programs, or in general secondary schools that have been fully converted into vocational institutions and offer 2-3 year courses in technical/vocational programs only. These schools are referred to as vocationalized secondary schools.

The training offered at institutions (a) and (b) is very specialized. Various ministries report 40-60 specializations in schools under their administration, with an aggregate of several hundred for each type of school. The training offered in category (c) schools is less specialized and has a common core of general subjects in all programs.

Recent Developments

3.02 Technical and vocational education has probably been more seriously affected by abrupt policy changes since 1949 than any other part of the education system. During the Cultural Revolution in the late 1960s and early 1970s, many technical and skilled worker training schools were closed down. School buildings were converted into factories or housing; equipment was dismantled and handed over to various enterprises or even scrapped. Teachers were reassigned or dispersed to the countryside.

3.03 These developments resulted from an attempt to create a society that consistently emphasized equality and eliminated the distinction between categories of labor, as reflected not only in the labor market and in the community, but also in the schools preparing students for work and adult life. To achieve this, all schools were to offer a common program, comprising a mix of studies and labor, for all students; streaming of students into general and technical/vocational streams was seen as favoring students of bourgeois background at the expense of students with peasant or other manual worker origins.

3.04 These policies have resulted in an acute shortage of technical and vocational skills. An estimated 15-20 million Chinese missed out on needed or desired technical and vocational education and training. Those entering the labor force lacked pre-employment training and enterprises were forced to

recruit people with only academic credits.[20/] As a result, the education profile of the active labor force is now unbalanced. The work force is characterized by a low percentage of skilled workers, technicians and trained managers and by a skewed distribution of staff by age group with the best qualified being those trained before the mid-1960s many of whom will enter retirement in the next 15 years.

3.05 The lack of technicians is particularly severe. Many industrial ministries and enterprises report that only 5% or less of their technicians have a university or technical school degree (some surveys have shown only 2.8% and 3.7%, respectively), while surveys of other developing and advanced countries show an average of 8.7%. In agriculture, Chinese statistics indicate that only 0.1% of the agricultural labor force are technical workers, which should be compared with a global average of 0.5%. The estimate is even lower if only those working in rural areas are counted. Overall, the percentage of the total labor force classified as technicians is 1.3%; this includes teachers, health personnel and others. The ratio of university-trained staff to middle-level technicians is often 1:1, whereas 1:3 would be a more appropriate ratio. This imbalance has made it difficult to find appropriately qualified staff to be shop floor supervisors, designers, laboratory researchers, and building site managers. Either unqualified workers or overqualified academics must of necessity take these assignments.

Enrollment Trends

3.06 Technical/vocational education has not achieved balanced expansion with general secondary education. The number of technical schools increased from 500 in 1950 to 2,000 in 1960 and the number of students from 0.1 million to 1.0 million, before declining to pre-1949 levels in 1970. Skilled worker training schools followed a similar pattern. In contrast, general secondary education has developed steadily: the number of schools increased from 5,000 to 30,000 and then to 80,000 in 1950, 1960 and 1970, respectively, while the number of students grew from 1.5 million to 15 million and then to 25 million in the same years.

3.07 While China's overall secondary school enrollment ratio compared well with the average for other developing countries, the ratio in technical/vocational education did not. The percentage of schools and students in technical/vocational education out of the total for secondary education

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20/ A Chinese study has claimed that it required about five years of general upper secondary school education plus apprenticeship training to make a lower secondary school graduate into a productive skilled worker under the Cultural Revolution system, compared with two to three years if the graduate had received formal vocational education. The study maintains, furthermore, that the longer training was 2.5 times more expensive.

declined from 15-20% in the 1950s to 1% in 1970,[21] which compares with 11% in other developing countries and 20% in advanced countries at that time.

3.08 Formal technical and vocational education was fully reconstituted in the late 1970s. An ambitious plan to increase enrollment in technical/vocational programs to 9 million students over 10 years, with an annual output of 2-3 million graduates, was launched. By 1983, technical schools had enrollments of 0.69 million students, with an estimated 0.14 million studying at the secondary level. In addition, skilled worker training schools enrolled 0.52 million students. Furthermore, 1.22 million students were taking vocational programs in vocationalized secondary schools, up from 0.23 million students in 1979. This gives a total of 1.88 million technical/vocational students at the secondary level, or some 5% of all secondary level students and over 20% of all upper secondary level students (Appendix B, Tables 3.1 and 3.2). This is a considerable increase over the 1970 level but is nonetheless lower than the ratio 25 years ago.

3.09 A detailed analysis of developments since 1979 reveals an uneven development of formal technical/vocational education.[22] While enrollment in vocationalized secondary schools run by the Ministry of Education has expanded considerably, technical schools run by the technical ministries have experienced a 4% decrease in enrollments over the last five years and skilled worker training schools no less than an 18% decrease in enrollments.[23] The simultaneous drop in agricultural and industrial technical school enrollments and increase in enrollments in similar programs at vocationalized secondary schools is difficult to explain given current policies and claims of manpower shortages. Enrollments in economics, business and law have increased in all schools, however.

3.10 There has been an increase in enrollments in nonformal technical programs at the secondary level run by various enterprises, from 2.2 million in 1979 to 3.3 million in 1982. These nonformal programs were originally intended to offer inservice (upgrading) training for workers. But the number of job applicants with only a general primary or secondary education forced enterprises to organize preservice vocational training and technical education programs for

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21/ This figure includes the many students in primary teacher training and health education.

22/ The quality of an analysis of technical/vocational education is limited by shortages of data on, for example, student background and achievement. The Central Institute for Education Research could again perform the function of information and data management for this type of education (cf. para. 2.44).

23/ The increase in the numbers of technical schools (from about 2,000 to 2,200) and skilled worker training schools (from 3,000 to 3,400) over the last five years makes these decreases in student numbers difficult to explain (the number of upper secondary schools has been halved, from approximately 40,000 to 20,000).

new employees.[24] Current nonformal programs therefore comprise a mixture of preservice and inservice training. These programs strain the resources of many enterprises, and their increased cost-awareness and profit orientation will make them less willing to run large preservice programs.

Technical Manpower Demand and Supply

3.11 The World Bank estimated in 1980 that for economic growth and staff replacement, China would require about 200,000 middle-level technicians and 1,200,000 skilled workers per annum in industry and agriculture.[25] The annual output of trained manpower at that time was 50,000 and 400,000, respectively. By 1983, the output for industry and agriculture combined was about 100,000 graduates from technical schools and 350,000 graduates from skilled worker training schools and technical/vocational secondary schools.

3.12 The remaining need for middle-level technicians and skilled workers is being met to some extent through nonformal programs. The output from nonformal inservice courses is estimated at around 600,000 technicians and skilled workers per annum. To this could be added the output from the employment training centers, although their short courses cannot produce fully skilled workers. It can be assumed that approximately half of the annual need for industrial and agricultural technicians and skilled workers is met through the formal school system. In industry the remaining needs are met through nonformal programs run by enterprises mainly to meet their own needs. Fewer nonformal programs so far meet the training needs of the agricultural sector. The following paragraphs discuss possible means of meeting manpower demand by economic sector.

3.13 Industrial Sector. Industry's nonformal education comprises both spare-time training (evening and correspondence courses and self-study), and part-time or full-time day courses. Spare-time courses are economical and utilize teachers and space at little additional cost, and with no cost to production of students or enterprises. Day-time courses entail higher opportunity costs because staff and workers would otherwise be well utilized in production. Enterprises should therefore focus on spare-time courses for adult employees and reserve full-time day courses for teenagers newly employed or other young people (i.e. it would, in effect, be preservice training). Chinese industrial enterprises have, in contrast to enterprises in many advanced and developing countries, taken an unusual responsibility for the education and training of their staff, and they should continue to be important for manpower development. They might, however, increasingly share the responsibility for preservice training with the formal school system (as managed by the Ministry of Education, Ministry of Labor and technical ministries). They could be particu-

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24/ In addition, labor service companies and labor bureaus under the Ministry of Labor set up employment training centers offering 2-6 month full-time courses for those "who are waiting for jobs." These centers reached 700,000 students in 1982.

25/ These estimates are conservative. Other estimates indicate a need more than three times higher.

larly supportive of formal technical/vocational training by providing part-time staff and granting access to facilities and equipment. They could also be active on councils and school boards, advising on labor market needs, skill requirements and curricula.

3.14 Management education has been singled out as a high priority. Most enterprises claim a serious shortage of managers, at the same time that planned reforms in the management of enterprises will require a different mix of management skills. Universities and specialized institutes should be responsible for full-time, preservice management education and enterprises for inservice, part-time training. Some management training could be offered in technical schools, but their students are generally too young to fully comprehend all aspects of management; moreover, they could only be given managerial responsibility too far in the future for such training at the secondary school stage to be useful.[26/]

3.15 Service Sector. Training for service sector employment has been neglected in the past and needs to be improved and expanded. The increased emphasis in China on consumer needs requires more training for technicians and skilled workers in service industries (e.g. repairers of consumer goods, and staff for shops and restaurants). Some jobs in this sector lend themselves well to preservice institutional training. Suitable programs can be sponsored by municipalities and counties in vocationalized secondary schools, since they would require less new investment in equipment. Training could often be conducted in existing school facilities after minor remodeling.

3.16 Agricultural Sector. Available statistics on agricultural manpower are inconsistent but indicate a large training need in China. The shortage of agricultural technicians to work on farms and in extension services is large (para. 3.05). Efficient nonformal on-the-job training for agricultural workers and technicians is generally difficult to develop, however. Inservice training schemes for agricultural technicians are being organized by the Ministry of Agriculture and should be expanded. Nevertheless, programs comparable in size and content to those for industrial technicians and skilled workers apparently remain scarce because of the constraints of manpower, money and logistics in rural areas. The preservice formal education system will therefore have to play a major role. Many of the vocationalized secondary schools already offer agricultural programs to help meet these needs and new programs are starting. The negative enrollment trend in agricultural technical schools should be reversed and their output at least doubled.

Issues in Technical/Vocational Education

3.17 The technical/vocational education system in China is basically sound and quite developed. Compared with schools in many developing countries of the same income level, facilities and equipment are reasonable and the system well managed and monitored from the ministry down to the school level. Although many

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26/ This is to some extent also true for university-level management education.

staff members need retraining, upgrading and sometimes more practical experience, these problems can be solved.

3.18 The Chinese Government is now embarking on a program of rapid vocationalization at the senior secondary level. Within ten years, about 50% of all upper secondary students should be in vocational programs (para. 2.54). This reflects China's manpower needs (paras. 3.13-16) and corresponds to its stage of educational development in the 1990s, when 55-60% of the relevant age group will enter upper secondary education. Efficient use of the manpower and facilities devoted to secondary vocational education will be essential if the Ministry of Education is to achieve this ambitious program of some 12-13 million students in vocationalized secondary schools.

3.19 The experience of other countries in implementing vocationalization programs has been mixed. Several shortcomings have often (but not always) been observed in systems that provide vocational education, particularly in industrial skills, in schools: schools can not easily duplicate actual working conditions for students; school equipment is often inappropriate (either outdated or in some cases too sophisticated); teachers may lack practical industrial experience themselves and tend to take a "bookish" approach to what should be "hands-on" teaching; and finally the syllabus may fall behind skill requirements. On the other hand, graduates of vocational secondary programs generally possess stronger academic background than those who enter the work force without secondary education and are often more able to adjust to changing work requirements including the introduction of new technology or promotion to assignments demanding more advanced knowledge as well as skills.

3.20 In other countries, a sizeable research literature has developed on technical and vocational education, broadly defined, including cost, financing and the linkages between education and training and employment.[27/] While the results tend to show that the relatively high costs of formal technical and vocational education are not associated with correspondingly higher benefits, in terms of increased worker productivity, by comparison, say, with general education or on-the-job training, the findings are not easily generalized. The returns to investment in technical and vocational education and training are generally high enough to justify expanding these activities, but no broad conclusion applicable across all countries can be drawn concerning the relative

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27/ See for example: F. Block, Evaluating Manpower Training Programs, (JAI Press, 1979), Greenwich Conn.; K. Drake, "The Cost-Effectiveness of Vocational Training: A Survey of British Studies," Economics of Education Review, Vol. 2, No. 2, 1982, pp. 103-125; T. Hu, "Studies of the Cost-Efficiency and Cost-Effectiveness of Vocational Education, "Information Series No. 202, National Center for Research in Vocational Education (Ohio State University, 1980) Columbus, Ohio; O. Metcalf, The Economics of Vocational Training: Past Guidance and Future Evaluations (World Bank Education and Training Department, 1984), Washington, D. C.; and G. Psacharopoulos and W. Loxley, Diversified Secondary Education and Development: A Report on the Diversified Secondary Curriculum Study (World Bank Education and Training Department, 1984), Washington, D. C.

merits of alternative approaches. Despite planning of major new investments in Chinese technical and vocational education, it appears that research into these questions in China is not yet complete.

3.21 Despite differences in education systems across countries, it is generally agreed that secondary vocational education should focus as much as possible on skills adaptable to a wide range of occupations. One solution is to provide much broader vocational education at the senior secondary level that offers more flexibility for responding to the demand for a particular type of manpower as it becomes apparent. This type of education would aim to achieve an intermediate level of qualifications on which short successive stages of schooling can build to produce the required manpower. While manpower planning can identify broad areas of need (e.g. chemists), it cannot forecast with any accuracy more specific requirements (e.g. for inorganic or industrial chemists). This suggests that for maximum flexibility, the secondary curriculum should be broad, and that more specific skills should be acquired after formal schooling.

3.22 It must be stressed that these general conclusions should be treated with caution and their relevance for China carefully studied. They do suggest, however, that it might not be wise to undertake a vocationalization program of the magnitude envisioned by the Chinese Government immediately; if implementation could be phased, the achievements of each phase could be evaluated as the program proceeds. Particularly in China, which has a tradition of enterprises training employees at the work place (para. 3.13), the relative cost-effectiveness of alternative education and training paths should be carefully studied.

3.23 Moreover, despite the overall favorable assessment of the quality and future prospects of technical/vocational education in China, problems do exist. The main issues that will need to be addressed as the vocationalization program proceeds are the high degree of specialization, the level of training, shortages of staff and facilities, and administration. An additional problem is the low status of technical/vocational education. These points are discussed below.

(a) Specialization

3.24 China's technical schools offer several hundred different programs. The situation is similar in the skilled worker training schools. Specialization and narrow training have certain advantages: training can be in-depth so that little on-the-job practice is needed to provide a fully productive worker; learning time and therefore costs are reduced; students are more motivated to study if links between the training and their future job are apparent; and much of the training can be conducted in enterprises, using their staff and equipment, at little extra cost.

3.25 Narrow specialization also has serious disadvantages, both for the Chinese economy as a whole and for the individual in pursuing a career. Achievement of the four modernizations will require large changes in the major economic sectors, such as agriculture, manufacturing, energy and transportation. These changes will require a more mobile, flexible and more highly skilled labor force. This mobility and flexibility are almost nonexistent now.

Most technicians and skilled workers have never changed their employer or major job assignment. They have lifetime appointments within one agency and often remain in the same workshop. By contrast, the experience of countries that have passed through a period of rapid industrialization suggests that much higher mobility of labor is necessary as workers move from low productivity enterprises and sectors to higher productivity ones. As workers change positions, even within enterprises, the costs of adjustment are less if technicians and skilled workers possess broad basic technical knowledge and skills to understand and adapt to new production technologies and tasks. A high degree of specialization and an insufficient general education [28/] base make it difficult for Chinese workers to do this. These changes highlight the importance of a broad educational foundation, onto which specific work skills can be built (cf. para. 3.21).

3.26 Narrow specialization also has costly consequences for the schools themselves. It increases the need for specialized facilities, equipment and staff, which may then be underutilized. Schools need larger catchment areas and as a consequence must bear the expense of providing boarding facilities. Despite large student catchment areas, most technical schools are still not able to use facilities, equipment and staff economically.

3.27 Recognizing the disadvantages of too many narrow specializations, some technical ministries are moving to more general technical/vocational education. For example, the Ministry of Machine Building is considering introducing a few broad disciplines in its technical institutes (which currently have 80 specialties) and technical schools (with 15 specialties).

3.28 Chinese authorities would be well advised to evaluate their technical/vocational education programs and curricula nationwide. The current vocationalization of upper secondary education provides an opportunity for such a review. A systematic study could be made of the technical and vocational education and training needs of major enterprises, after which common elements in their needs would be determined. Training could be better coordinated so that local authorities are not running their own highly specialized schools, with the risk of duplication and waste of resources. The review could also cover curricula and teacher supply, as well as the need for facilities, equipment and didactic materials. Such a review and the vocationalization program could provide an opportunity for linking schools offering technical/vocational education both vertically to enterprises and technical agencies, and horizontally to local authorities through school boards and advisory panels. Such a review would need participation by the relevant technical agencies and the Ministries of Education and of Labor.

28/ Industrial managers generally require workers with a full lower secondary education, but most workers actually have only a primary education.

(b) Duration and Level of Training

3.29 Since few general upper secondary education graduates can proceed to universities, many apply for entry to technical or even to skilled worker training schools. While many courses at these schools are designed for such graduates, others are upper secondary courses, with lower secondary education as the base for intake. Acceptance of upper secondary school graduates to the latter courses implies an unnecessary lengthening of the study time to gain a certificate, subject repetition, and extra costs both for the individual and society. (Currently about 80% of technical school students have upper secondary education certificates, though their courses may not require it.)

3.30 Most vocational and technical courses could be at the upper secondary level, occasionally with an additional year. Eight to nine years of basic education should be seen as a sufficient but also necessary entrance requirement.[29/] Positive discrimination in favor of applicants from lower secondary schools and against those from upper secondary schools might help avoid having "overqualified" students in technical/vocational education. Increasing the intake of lower secondary school graduates in this type of education could reduce the pressure for places in general upper secondary schools and the overall recurrent costs of education. Upper secondary school graduates who do not enter the universities might be offered opportunities for further education by expanding the recently established postsecondary short-term colleges (polytechnics).

(c) Shortages of Staff and Facilities

3.31 The shortage of staff, equipment and facilities is apparently severely constraining the expansion and improvement of technical/vocational education. Many schools lack teachers qualified to teach a contemporary technical/vocational curriculum, and the vocationalization program will require many additional teachers. Although physical facilities are reasonable by the standards of many LDCs (para. 3.17), much of the necessary equipment and other teaching materials in classrooms, laboratories and workshops is outdated or not available. Buildings have often deteriorated and are poorly maintained. Some provinces claim that the construction of new technical and skilled worker training schools has been forbidden. While a restriction like this has some validity in China, given the general underutilization of school space and the possibilities for remodeling existing facilities (rather than constructing new ones) as secondary schools are vocationalized, the need for new schools should be assessed on a case-by-case basis.

3.32 Teacher upgrading programs, provision of new equipment, and remodeling and renewal of physical facilities are needed. This will require considerable amounts of capital and technical know-how, the latter for staff upgrading and for rehabilitating the teaching materials and equipment industry. Nonetheless

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29/ Some lower secondary schools in China's rural areas offer vocational programs which, judged by the experience of other countries, are at too low a level (cf. paras. 2.34-35).

some actions can be taken to expand technical/vocational education without capital investments. First, the current teaching staff could be better utilized. The workload of China's technical/vocational teachers is often only half that of teachers in OECD countries, and student/teacher ratios are consequently too low. Second, space and equipment utilization could be improved. Most institutions would have to increase their facility and equipment utilization rates by 50% to reach the levels of schools in OECD countries. Third, the high degree of specialization and the administrative structure of technical/vocational education (discussed below) lead to large student catchment areas and therefore the need for boarding almost all students, for which insufficient boarding facilities exist. Accelerating the change to a combined day school/boarding school system could facilitate considerably the expansion of China's technical/vocational education.

(d) Administration

3.33 Overall responsibility for technical and vocational education rests with the Ministry of Education, but the operational planning, development and management of most technical and skilled worker training schools are handled by technical ministries and their subordinate agencies and enterprises. The Ministry of Labor is also a major administrator of training and is responsible for skilled worker training schools.[30/] This administrative setup is typical for planned economies. The arrangement has certain advantages over organization solely under the Ministry of Education: the development of technical and vocational education is closely monitored by the sector and ministry concerned, so the quantity and quality of that education can be closely related to the needs of the sector it serves; technical and vocational education can be organized into manageable units, which is important in a country of China's size; and the financing of technical education is facilitated by the close relationship between the consumer (the enterprise) and the products (the graduates) of technical/skilled worker training schools.

3.34 The arrangement also has disadvantages, however. The specialized agencies have narrow interests and their training programs support the current high degree of specialization; they tend to train staff only as broadly and in such depth as is currently and directly needed in their enterprises. This means that education programs may not meet overall manpower needs in terms of either quantity or quality. Moreover, training is often closely tied to production technologies in the parent enterprises, which may be outdated, and to products that may not meet future demand. It is furthermore difficult to organize a unified system to control the standard of qualifications and certification. Finally, there is a risk of duplication and waste, with overproduction of technicians and skilled workers in some sectors and underproduction in others, and with low use of school facilities and staff in one school but shortages in another.

30/ This ministry is important in the context of international cooperation and assistance. Thus the Chinese Government has two agencies dealing with technical/vocational education internationally, both of which are fairly independent.

3.35 A change is needed in the administrative structure of formal technical and vocational education, to promote horizontal linkages and efficiency while retaining the current vertical cooperation. This might imply transferring some administration of technical/skilled worker training schools to bureaus at various levels under the Ministry of Education, while creating arrangements to keep professional links to enterprises such as those in agriculture and industry. (It would not imply any change in nonformal, inservice training, which has so far been very successfully handled by technical agencies and enterprises.) However, major organizational changes of a sector such as education without corresponding changes in related sectors would probably be impractical and politically impossible in a country of China's size and overall administrative structure. Management of the technical/vocational education system needs to be studied to identify other ways of improving horizontal links in the system and of reducing waste.

(e) Status of Technical/Vocational Education

3.36 As in many other developing countries, the prestige and social status of technical/vocational education is low compared to that of academic education. This is so despite a high degree of economic and social equality in China as compared with other countries at the same income level. Students and their parents consider that academic graduates have better career prospects than graduates of technical/vocational education. Technical and skilled worker training schools are perceived as terminal. The high degree of specialization also reduces horizontal and vertical mobility within the education system for students in these schools. Furthermore, selection and examination methods that favor cognitive achievement and may have limited predictive value for technical careers distort recruitment to these schools. Technical and skilled worker training schools - particularly those in agriculture - compete poorly in such an environment for the better and most suitable students. The K-school system further increases the existing bias against training in agriculture and industry at the secondary and post-secondary (nonuniversity) levels. There are no easy remedies to these problems, which are of long standing. However, European experience shows that this situation can be changed. Part of the solution lies outside the education system and relates to the prestige and awards associated with various professions, regardless of salary levels.

4. TEACHER TRAINING

4.01 Development of teacher training programs should be seen in light of current staffing levels and the Government's education policies and targets discussed above. The present situation is generally one of a shortage of qualified teachers but an abundance of unqualified teachers at all levels of the education system. While one need of teacher training is to meet the demand for new teachers throughout the education system, the quality of many existing teachers also needs to be upgraded. This section therefore begins by looking at projections of the demand for and supply of teachers at the primary and secondary education levels, dealing with both preservice and inservice

programs. It then deals with four more general issues of teacher training - curricula, structure, administration and the status of teachers.[31]

Teacher Demand and Supply [32]

4.02 Primary Level. World Bank estimates have indicated that enrollments in primary education would decline considerably over the next 15 years, from 136 million in 1983 to around 95 million in the late 1990s. The need for teachers would decrease correspondingly. At present, primary schools are overstaffed by the standards of many developing countries, albeit with many unqualified teachers, and overstaffing might increase considerably if corrective measures are not taken.

4.03 Preservice training was conducted in some 1,050 institutions with 484,000 students (and 34,000 teacher trainers) in 1979. In 1983, enrollment had decreased to 455,000 in some 860 institutions (teacher training staff had inexplicably increased to 40,000). Output has averaged 180,000 per year over the last five years.

4.04 The World Bank has projected the future need for and supply of primary teachers up to the year 2000 with varying assumptions about: (a) supply (continuing the present supply of new teachers or no supply after 1986); (b) the student/teacher ratio (using the current 25:1 or a gradual increase to the average for developing countries, i.e. 34:1); and (c) the annual staff attrition rate (3% or 5%). A fixed assumption is that most unqualified teachers can be upgraded to a satisfactory level. Several scenarios have been developed and are summarized below (Table 4.1). The need for teachers would decrease from 5.4-5.5 million to 3.8 million. Maintaining the current supply of new teachers (say 200,000 per year) and student/teacher ratio could lead to teacher surpluses of up to 2.2 million. Increasing the student/teacher ratio to 34:1 would further increase the surplus. A complete halt to the output from primary teacher training schools would only lead to serious shortages if the attrition rate were 5%, and even so, any shortage could be offset by increasing the student/teacher ratio to 34:1.

31/ A teacher education meeting in China in the early 1980s assessed the issues in teacher training quite well by stating that it was necessary to improve teacher training, establish well-defined standards for teacher certification, enhance the social status of the teacher and support education research.

32/ All predictions of teacher requirements are based on the enrollment projections given in Chapters 2 and 3, and they are thus dependent on the accuracy of demographic data.

Table 4.1: PROJECTED PRIMARY TEACHER SURPLUS OR SHORTAGE IN THE YEAR 2000 (Million)

Student/teacher ratio	Constant supply of 200,000 new teachers per year		No new teacher supply beyond 1986	
	3% attrition	5% attrition	3% attrition	5% attrition
Current S/T ratio maintained	+2.2	+0.7	+0.0	-1.1
S/T ratio increased to economic LDC average	+3.1	+1.7	+1.0	-0.2

Note: Plus (+) sign indicates teacher surplus and minus (-) sign indicates teacher shortage.

Source: World Bank estimates.

4.05 Closing all the primary teacher training schools is, of course, not feasible. It would skew the age structure of the primary school teaching staff, and there would be no fresh entrants to the profession over a long period. An important means of renewal would be removed from primary education. Primary schools would have reduced access to recent developments in education, such as curriculum content, learning methods and student evaluation, which are, or should be, provided by teacher training institutions. Several primary teacher training schools must therefore continue to function, but their overall enrollment and output need to decrease to avoid a growing teacher surplus.

4.06 A gradual closing of some primary teacher training schools might be feasible and even acceptable from a quality point of view, since 40% of the staff at these schools is said to be unqualified. Furthermore, their facilities are claimed to be worse than those of many upper secondary schools, partly because many of them were moved to rural areas during the late 1960s and early 1970s, were located in poor buildings and had few didactic materials.

4.07 Many advanced countries have faced situations similar to that in China. They have had to reduce primary teacher preservice training and reemploy superfluous staff in primary schools and teacher training colleges. Some colleges were closed and staff retrained. The enrollment decline in primary education has often coincided with the extension of compulsory basic education from six to eight or nine years. Excess qualified staff were then upgraded to teach in the upper grades of the extended system; this helped to solve a teacher shortage in Grades 7-9 of the new system and reduce a teacher surplus in primary education (Grades 1-6). China faces a similar situation with its decision to make lower secondary education universal in the 1990s,

and similarly it could retrain and transfer some of its better primary teachers who have good subject knowledge to junior secondary schools (reportedly about 300,000 primary teachers are overqualified).

4.08 A significant need for inservice training is the result of developments in primary education over the past 15 years. The primary education system expanded by 50% during the late 1960s and early 1970s. Both as a matter of policy and necessity, authorities hired many unqualified teachers, such as primary school graduates.

4.09 In 1980, the authorities reported that 53% of the 5.5 million primary teachers were unqualified, i.e. 2.9 million unqualified teachers versus 2.6 million qualified teachers (this figure corresponds to the aggregate of primary teacher training school graduates during the preceding decades). In 1983, a reported 48% of the 5.4 million primary teachers are unqualified, or 2.6 million, which implies that some 0.3 million have been upgraded during the preceding years.[33/] A recent estimate of the education profile of China's primary teachers is shown below.

Table 4.2: PRIMARY TEACHER STOCK BY QUALIFICATIONS AND AGE, 1982 ('000)

	Level of Qualification					
	Severely Unqualified	Unqualified	Partially Qualified	Fully Qualified	More Than Qualified	
Age groups	Less than secondary school	Some secondary school	Full secondary school, but no education training	TTC graduate	More than TTC graduate	Total
Up to 30	156	235	465	470	49	1,375
30-39	160	260	470	630	130	1,650
40-49	206	275	412	413	69	1,375
50-54	138	165	138	82	27	550
55 and over	165	165	165	55	0	550
Total	825	1,100	1,650	1,650	275	5,500

Source: Information provided by MOE.

33/ Other sources report percentages of unqualified primary teachers as 40% and 50%, respectively, in 1980 and 1983. Other claims are that one-third of teachers are qualified, one-third are unqualified but could become qualified through upgrading, and the final third are unqualified and untrainable. In China this is referred to as the 3-3-3 problem.

4.10 In 1981-82, inservice training was offered in about 2,100 institutions, which are normally separate from preservice institutions. This implies that most counties in China have an upgrading program for their primary teachers either on a full-time or part-time basis. In addition, there were about 30 inservice colleges at the provincial level and 250 at the prefectural level.

4.11 For teacher training at the primary level, the issue is whether to concentrate on inservice education for existing primary teachers (for upgrading or prior to their transfer to lower secondary teaching) or on preservice education to supply new teachers. The Government has claimed that 0.55 million teachers aged 55 and over will retire early (normal retirement age for male teachers is 60 and for female teachers, 55). Some 0.34 million severely underqualified teachers aged 40-55 will be required to move into other professions. These moves would correspond to the 3-5% attrition rate assumed in the projections (para. 4.04) if they are carried out during the next 3-5 years. Continued annual attrition at this rate would further reduce the number of less qualified teachers, but at least one million would still remain at the end of the century, i.e. about 25% of the needed stock. This percentage is high; 10% or less would be more appropriate and approach the standards of advanced countries.

4.12 The Government has already launched large inservice teacher training programs. A reported 1.3 million primary teachers are taking part in these programs, of which 0.8 million have already completed their training. It has furthermore been stated that 1.7 million teachers would be upgraded during 1982-85. There would be two-year courses for the 0.3 million primary teachers with only a primary education, and 2-3 year courses for the 0.5 million primary teachers with some secondary education. A total of about 1.5 million teachers would be trained during the remainder of the century.

4.13 The final aim of this program is to have all primary teachers with teacher training equivalent to two years' postsecondary study. Complete and efficient execution of the program would make most primary teachers qualified by 1990. The program's goal is perhaps overambitious, as is discussed further below (para. 4.28). The facilities are available to complete the program. For financial reasons, however, the program should be conducted on teachers' spare time to the extent possible, rather than being full-time study that requires teachers to be granted paid leave. Wide use of distance teaching would make this approach feasible (para. 4.26).

4.14 Secondary Level (Including Technical/Vocational Education). To assess the need for preservice training, the World Bank has projected the demand for and supply of secondary school teachers up to the year 2000, based on enrollment projections for lower and all types of upper secondary schools (paras. 2.53-55). Several assumptions have been made about enrollments, in line with the Government's targets (discussed above): (a) lower secondary education would be universal by the year 2000; and (b) upper secondary education would be vocationalized and achieve an enrollment ratio of close to 60% by the year 2000. It has further been assumed that the training of secondary school teachers would grow as fast as the overall higher education system.

This means that the annual output of college and university trained academic and technical/vocational teachers would double from 100,000 and 30,000 respectively in 1983, to 200,000 and 60,000 respectively in the year 2000. It has been assumed that inservice training (discussed below) would continue - that unqualified staff would be upgraded but not replaced. Student/teacher ratios were calculated using either a constant 18:1 for academic subjects and 8:1 for technical subjects (the current ratios) or improved ratios of 20:1 for academic subjects and 15:1 for technical subjects, which are nearer the desirable standards of developing societies. The attrition rate for teaching staff has been assumed as 3% or 5% per annum.

4.15 The projections suggest that the current stock of secondary-level teachers of 2.9 million (of whom 0.1 million are in technical/skilled worker training schools) would have to increase to 3.7-4.4 million. The different scenarios depend among other things on assumptions about: student/teacher ratios; the retirement age of teachers; and the attrition rate for teachers (because of death, disability or transfer to nonteaching positions). The actual or assumed values for these variables will naturally have a considerable impact on estimates of teacher supply and demand. The values chosen here are considered reasonable, but Ministry of Education planners will need to monitor developments closely, so that projections are updated based on the actual values of these variables.

Table 4.3: PROJECTED SECONDARY TEACHER SURPLUS OR SHORTAGE IN THE YEAR 2000 (Million)

Student/teacher ratio	Academic teachers		Technical/vocational teachers	
	3% attrition	5% attrition	3% attrition	5% attrition
Current S/T ratio maintained	-0.3	-1.0	+0.0	-0.1
S/T ratio increased to economic standards	+0.4	-0.4	+0.1	+0.0

Note: Plus (+) sign indicates teacher surplus and minus (-) sign indicates shortage.

Source: World Bank estimates.

With the current student/teacher ratios and an annual staff attrition rate of 3%, a doubling of the capacity of institutions that train technical/vocational teachers would meet the demand for such teachers. A gradual doubling in the supply of academic teachers would not suffice: a constant shortage of qualified academic teachers would occur (without even considering replacement of unqualified teachers), mainly because of the large expansion of lower secondary education. With the current student/teacher ratios, but with an attrition rate of 5%, a minor shortage of technical/vocational teachers would

occur, while the shortage of academic teachers would increase to 1 million. With a gradual increase in student/teacher ratios, and an attrition rate of 3%, the current annual supply of technical/vocational teachers would suffice. There would be a shortage of academic teachers in the 1980s, but eventually a minor surplus in the late 1990s. With a gradual increase in student/teacher ratios, but with an attrition rate of 5%, the supply of technical/vocational teachers would still suffice while there would be a shortage of 0.4 million academic teachers.

4.16 Under these alternatives the demand for technical/vocational teachers could be met through the projected output from institutions training such teachers. It would be difficult, however, to meet the demand for academic teachers without increasing the output of normal colleges and universities beyond the assumed doubling (and upgrading of suitable primary teachers). An increase in the student/teacher ratio would also be feasible (to be achieved through increased teacher workloads rather than through larger classes).

4.17 As with primary teacher training, there is a significant need for inservice upgrading of secondary teachers, largely as a result of developments over the past 15 years. During the Cultural Revolution, secondary school enrollments expanded even faster - at 250% - than enrollments at the primary level. This led to a serious shortage of qualified teachers. Lower secondary school graduates became secondary school teachers without any further training; it has even been claimed that primary school graduates were recruited as secondary school teachers.

4.18 There are currently 2.1 million lower secondary school teachers, of whom about 70% are said to be unqualified, and 0.5 million upper secondary school teachers, of whom 40% are claimed to be unqualified. In addition, about one-third of teachers in technical/skilled worker training schools, teaching either academic or technical subjects, are claimed to be unqualified. There is a total demand for upgrading of about 1.7 million unqualified secondary teachers.

4.19 Inservice upgrading courses have been established to cope with the shortage of qualified teachers in general secondary schools. About 0.6 million teachers are currently being upgraded in some 280 institutions. Many courses are on a spare-time basis and last 3-5 years. The annual output of graduates has been 0.1 million. Some 0.2 million teachers are expected to take full upgrading courses during 1982-86. About 0.6 million will receive training on teaching methods and use of equipment. All unqualified academic secondary teachers would take upgrading courses before the year 2000, which corresponds to approximately 0.1 million per annum.

4.20 There does not seem to be a similar large-scale, inservice training program for teachers in technical/vocational subjects. Most of these teachers work for enterprises and local authorities. Many enterprises and agencies have comprehensive upgrading programs for technicians and workers, but none of those observed by World Bank staff has focused on upgrading teachers in technical and vocational subjects. This teaching force is smaller and therefore the absolute number of unqualified teachers is also smaller, so the need for

higher costs and greater problems of organization and implementation than academic upgrading, because the teaching force is dispersed among many authorities. Such inservice training is needed, however, and might well be undertaken by the Ministry of Education, which has not only overall responsibility for education but also a major role in the vocationalization program for secondary education. The Ministry should thus consider upgrading for teachers in technical and skilled worker training schools run by technical ministries, as well as for teachers in the vocationalized secondary schools.

Issues in Teacher Training

(a) Curricula

4.21 Since the late 1970s, the technical knowledge of teachers has been emphasized, but without neglecting the teacher's responsibility to help students prepare for life in society. According to current policy, teachers should: have a good academic knowledge of the subjects they teach; have a good knowledge of pedagogy and psychology, to know both how to teach and how human beings learn; and be an example to their students through their beliefs, attitudes, behavior and political consciousness (political education would take place not only through teaching but also through the teacher's example). The curricula of teacher training institutes are supposed to reflect these requirements but do so only partially.

4.22 There is a unified curriculum for preservice primary teacher training schools (see Appendix C) but not for preservice secondary teacher training or for inservice education. The curriculum of the primary preservice teacher training schools devotes 84% of scheduled time to subject teaching, about 6% to pedagogy and psychology, and about 10% to teaching methodology. This is a 3-year course totaling 101 weeks, with an additional 8 weeks of teaching practice and 4 weeks of manual work. In secondary teacher training and in inservice teacher training, the universities and other teacher training institutions offer their own programs based on a model supplied by the Ministry of Education and modified to suit local conditions. Pedagogy and psychology account for 2-3% of scheduled time and teaching methodology another 2-3%, while the remaining 95% is subject teaching.

4.23 The curricula of preservice teacher training institutions give subject knowledge highest priority, and the ratio of subject teaching to professional training is weighted towards the former. This is a reversal of the past trend, when subject knowledge was underemphasized. Some secondary teacher training colleges and universities seem now to emphasize subject teaching and basic research in subjects such as physics and chemistry at the expense of teaching and research in pedagogy and psychology. Some teacher training institutions may not even be offering courses in the latter subjects. Teaching practice is also sometimes neglected, particularly in secondary teacher training. (It has been mentioned in the Chinese press that primary and secondary schools do not cooperate with the colleges in organizing teach-

ing practice.)[34/] While it is important for Chinese teacher training institutions to emphasize subject knowledge and raise the academic standards of teaching staff, this should not be achieved at the expense of teaching and research in pedagogy and psychology.

4.24 The World Bank's 1981 Economic Report drew attention to the subject specialization in China's general education schools. This involved primary schools using subject teachers in addition to class teachers, and teachers in secondary schools often teaching only one subject instead of two or three. This practice is uneconomical, as it requires larger school sizes to keep all teachers fully employed. It is often unsuitable for pedagogic reasons, as it tends to compartmentalize teaching. During the last few decades, developed countries have tended to integrate subjects (e.g. natural science subjects such as physics, chemistry and biology, and social science subjects such as civics, history and geography) and have one teacher for each group of subjects taught at the secondary level (they continue to use class teachers in primary schools). This approach requires teachers with wide knowledge. It may not yet be feasible in China but should be considered in education planning (paras. 2.48-49).

4.25 Inservice teacher training is also subject oriented. This is appropriate, since participants in inservice courses have generally had several years of teaching practice, but their subject knowledge might be weak if they attended schools and colleges during the Cultural Revolution. The courses therefore rightly place heavy emphasis on academic performance and the teaching of subjects such as mathematics, physics and chemistry. In addition, courses in pedagogy are often offered on a part-time or short-term basis.

4.26 The Chinese system of preservice and inservice training of teachers shows considerable ingenuity. The courses are organized on a full-time or part-time basis, as correspondence courses, and via radio and television. This ingenuity could be used to remedy the shortage of well-qualified professors in pedagogy and psychology. Greater use of various organizational forms and the mass media, including closed-circuit TV with videotaped programs, would allow teaching in pedagogy and psychology to be expanded and improved despite staff shortages.

(b) Structure

4.27 The current preservice teacher training system has three components:

(a) teacher training schools at the upper secondary level, which train primary teachers (and preschool teachers) in 3-year courses;

(b) teacher training colleges at the postsecondary level, which train lower secondary teachers in 2-year courses; and

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34/ This situation is similar to that in some European countries prior to the major reforms after World War II, which modeled teacher training on the American system.

(c) teacher training universities, also at the postsecondary level, which train upper secondary teachers in 4-year courses.

These courses vary somewhat and some last an extra year. The distinction between the training of lower and upper secondary school teachers is not very clear.

4.28 The Government is working on a policy and program to require two years of postsecondary education for primary teachers. There is also a tendency to extend the training of lower secondary school teachers. This extension of teacher training programs in China may neither be educationally necessary nor economically feasible under the current circumstances. Many advanced countries have until recently considered that primary teacher training can be efficiently conducted in institutions at the upper secondary level. Raising primary teacher training to the postsecondary level increases the costs both to society and the individual, without necessarily improving teaching. Experience in some countries indicates, in fact, that graduates from secondary-level teacher training schools may become better teachers than graduates from the postsecondary teacher training colleges. Graduates in the former category have made teaching their first career choice more often than those in the latter category. They are consequently more motivated and satisfied in their jobs. An extension of the training for lower secondary teachers might be educationally feasible but should perhaps be postponed for a few years. Since a temporary shortage of lower secondary teachers has been predicted, lengthening the teacher training course would extend the shortage by a year. Financing saved by a delay in implementing this change might be better used in other parts of the staff training program.

(c) Administration

4.29 The administrative division between preservice and inservice institutions makes efficient teacher training more difficult than is necessary. Several teacher training institutions offer both preservice and inservice training, but many offer only one kind of training. Inservice upgrading of teachers grew in most developed countries during the second half of this century. It was usually considered an advantage to offer preservice and inservice training in the same institutions - but without necessarily merging the programs - because of more efficient use of staff, facilities and equipment (teaching could take place also during the breaks in a conventional academic year). It was also considered important that the combination of training could facilitate feedback to the teacher training institutions on the actual experience of inservice trainees, and this experience could be reflected in the preservice programs. In this way, inservice training would constitute a valuable link to school life. This linkage is not as well developed in Chinese teacher training as it could be. Moreover, China's need to reduce preservice training while continuing or expanding inservice training in primary education is an additional reason for joint use of staff and facilities in teacher training schools.

4.30 There are several other issues in the management of teacher training programs. Physical facilities and equipment are often in poor condition.

Logistical problems in administering inservice programs concern the boarding of full-time participants or their transportation between home and the training institutions. There is a shortage of professors not only in pedagogy and psychology, but also in foreign languages and the sciences.

(d) Teacher Status

4.31 The social position of the teacher in China has been ambivalent and has changed over time. Although philosophers like Confucius and Mencius and politicians like Mao have been considered great teachers and were highly regarded, the social status of teachers has nevertheless not always been high. Teaching was often a profession taken up by lower level civil servants who did not pass examinations for higher qualifications. The comparatively low status of teachers in China has hampered the recruitment of talented people to the teaching profession, a situation that the Chinese Government is still struggling to correct.

4.32 The development of education was a high priority for the new regime in 1949. The Government sought to improve the quality and status of the teaching profession and made some progress during the 1950s and early 1960s. This changed during the Cultural Revolution when many teachers were intimidated, even physically abused, and sent for "re-education." Their salaries were lowered to be barely above the subsistence level. The use of many unqualified teachers further lowered the prestige of the teaching profession. These developments during the 1960s and 1970s have dealt a serious blow to the quality of China's education, as teacher morale and motivation have a high positive correlation to student performance.

4.33 The Government is making great efforts to rectify this situation. Improvements have taken place but problems still exist. Teacher salaries have been raised three times since 1977 and teachers in urban areas, mostly state appointees, do fairly well. The locally hired minban teachers, most of whom teach in rural primary schools, continue to have low salaries. Their salaries vary from county to county but, even taking into account payments in kind and perhaps free or almost free housing, are often only half the salary of the state primary school teachers. Their salaries may be Y 30-40 per month compared with Y 60-80 for many state teachers.

4.34 Recruitment problems, which are thus worse in rural areas, have had a negative impact on the intellectual quality of teachers. The academic standards of teacher training institutions have dropped, and employing agencies (provincial and prefectural Education Bureaus) sometimes even reject the graduates allocated to their districts. Under these circumstances it is, of course, difficult to find teachers who fulfill the three functions of a teacher defined above (para. 4.21).

4.35 The Chinese teacher is, nonetheless, generally motivated and in many ways industrious despite low pay and ambivalent social status. Teacher absenteeism has been low and classroom work diligent compared with the situation in other developing countries. Recent developments, particularly in rural areas, may change this. Before the introduction of the responsibility system (para. 2.27), teachers in rural areas were given work points and an allowance

equal to those of an average commune or brigade worker. At the end of the year, they shared in the distribution of commune profits according to work points accumulated. In addition, they received an annual state allowance. Under the responsibility system, these teachers have been given production responsibilities for a plot of land. They contract a portion of their production to the brigade or commune but may sell the rest. They receive no further income from the commune or brigade, but do still receive the state allowance.

4.36 Under this system, the teacher has good reason to spend as much time as he can working on his plot of land to increase his income without consideration of his performance in the classroom, which could deteriorate without affecting his income. Furthermore, if he does not accept the land allotment, he cannot increase his income. As a consequence, many teachers spend an increasing amount of time on the land and less time on teaching, which has a negative impact on school achievement and student learning. The deterioration of education is said to have been serious in some parts of China. If sufficient attention is not given to the present negative trends in teaching, a situation similar to that in some Latin American countries may develop, where primary teachers spend most of their time pursuing other jobs and neglect their teaching.

4.37 The negative consequences of the responsibility system on the quantity and quality of education can and should be removed. Means need to be found of relating teachers' income solely to work with their students and instruction time, and to school performance in general. Changes of occupation should not be discouraged however, and teachers in rural areas should not be prevented from taking up farming full time. The incentives to enter and remain in the teaching profession should be positive, including further salary increases. Such increases would be financially feasible, given the overall decrease in the size of the education system and the consequent reduction in teacher demand. They could be justified by suggested increases in teacher workloads and related to performance.

5. EDUCATION COSTS AND FINANCING

Background

5.01 The World Bank's 1980 Economic Mission analyzed the costs and financing of education and training in China and concluded that China (public authorities, enterprises and individuals) had spent less on education than could have been expected given the impressive quantitative developments in primary and secondary education. Major reasons for such low education expenditures were low teacher salaries and limited outlays for educational materials and buildings. Local communities, enterprises and, to some extent, parents had borne a fairly large proportion of the costs of education at the two lower levels. Their ability to bear these costs had varied, however, and differences in the quality of primary and secondary education existed between localities. The unit costs of higher education were high by the standards of other countries and could be reduced. Achievement and efficiency could be improved throughout the education system with minor affordable budget increases and better staff utilization.

5.02 The 1980 mission also found that financial data on China's education system were not always well documented, and it was therefore difficult to get a clear and comprehensive picture of education costs and financing. This general conclusion is still valid. The present analysis of education costs and financing is based on figures from the Ministry of Education's subsequent budgets and information about education expenditures by technical ministries, provinces, municipalities, enterprises and parents. However, the picture is incomplete given that financial responsibility is divided among so many agencies and levels of society.

5.03 This chapter looks first at total education expenditures (capital and recurrent) and makes an international comparison. An analysis of costs and financing by education level follows. This analysis is based on the most recent budget information available (i.e. for 1982). The chapter concludes by looking at the financial feasibility of ongoing and planned programs in primary, secondary and technical/vocational education.

Current Spending

5.04 Public and private spending on education continues to be small in China - in relative terms and compared with levels in other countries - despite an increase in absolute amounts during the last few years. It was estimated that China spent slightly more than 3% of its GNP on education in 1979. The percentage remains about the same in 1982. It should be compared with a median of 4-5% in other developing countries and 6% or much higher in developed countries. Government spending on education as a percentage of its total expenditures has increased from an estimated 6.6% to 7.1%, but remains much below the median in other developing countries (15.5%) and advanced countries (15%). The Chinese Government takes greater responsibility for welfare and for the nation's economic, social and cultural development than the governments of most developing countries, which implies that the percentage of the budget going to education would be lower in China than in these countries; but this cannot fully explain so large a difference.

5.05 International comparisons of unit costs, measured in US$ equivalents, should be made with great caution, given the artificiality of many exchange rates. Caution is particularly advisable when comparing societies with different economic systems. If such comparisons are made using current data, the conclusion of the 1981 report that education allocations are low in China is still valid. The average allocation per student in China has increased by about 25% during the last four years to US$50-52 equivalent. This is, nevertheless, below the average allocation of approximately US$80 per student in the 65 countries of the low-income group with which China may best be compared.

5.06 Per student costs (recurrent and capital) in primary and secondary education, measured as a percentage of GNP/capita, are also low in China compared with those in developing and developed countries (Table 5.1). Only in tertiary education does the allocation per student remain high. The allocation per student has remained largely the same in primary and secondary education. This implies that the increase in yuan/student has just kept pace with the GNP/capita increase. Low salaries in China still explain most of the

differences between China and other countries in primary and secondary education. The high cost in university education is caused by low staff and facility utilization rates.

Table 5.1: TOTAL UNIT COSTS OF EDUCATION AT DIFFERENT LEVELS AS A PERCENTAGE OF GNP/CAPITA /a

	China		Other developing countries	OECD countries
	1979	1982		
Primary education	8	8	14	22
Secondary education	19	23	41	24
University education	411	385	370	49

/a Public recurrent costs only.

Source: World Bank estimates.

5.07 The World Bank has estimated that total capital and recurrent education expenditure increased by 40% between 1979 and 1982 in current prices (Table 5.2). Annual capital expenditures have more than doubled and reflect investments in secondary and higher education. Public expenditure accounted for 64% of total education expenditures in 1979, but 74% in 1982, mainly because of the general salary increase for state employed or state subsidized teachers. The private (family) contribution to education has increased to 10% of total education expenditures. The contribution from local sources has increased in absolute terms but fallen as a percentage of total spending.

Table 5.2: ESTIMATED TOTAL EDUCATION EXPENDITURES, 1979 AND 1982
(Y billion)

	Public expenditure		Expenditures by provinces, enterprises, etc.		Private expenditures (books, fees, etc.)		Total Exp.		% change
	1979	1982	1979	1982	1979	1982	1979	1982	
Primary education	2.5	4.2	1.2	1.3	0.7	0.7	4.4	6.2	+ 50%
Secondary education	3.4	5.0	1.1	1.6	0.2	0.6	4.7	7.2	+ 50%
Tertiary education	2.5	3.7	1.4	1.0	0.1	0.2	4.0	4.9	+ 25%
Total	8.4	12.9	3.7	3.9	1.0	1.5	13.1	18.3	+ 40%
of which:									
Capital exp.	0.7	1.7	0.7	1.6	-	-	1.4	3.3	+135%
Recurrent exp.	7.7	11.2	3.0	2.3	1.0	1.5	11.7	15.0	+ 30%

Sources: Central Government, local authorities, enterprises and various educational institutions.

5.08 Recurrent expenditures provided through the Ministry of Education have grown even more than the total budget. They have almost doubled since 1977, the first year for which the Bank has data (Table 5.3).

Table 5.3: GROWTH OF MINISTRY OF EDUCATION RECURRENT EXPENDITURES, 1977-82
(Y billion)

	1977	1978	1979	1980	1981	1982	Growth 1977-82
Higher education	0.78	1.14	1.61	1.78	2.05	2.01	160%
Primary teacher training	0.15	0.20	0.24	0.30	0.30	0.33	120%
Secondary schools	1.74	2.17	2.40	2.92	3.09	3.49	100%
Primary schools	1.57	1.77	1.95	2.55	2.87	3.39	115%
Special allowances	0.73	0.81	0.84	0.95			
Miscellaneous	0.33	0.47	0.66	0.30	0.93	1.02	
Total	5.30	6.56	7.70	8.80	9.24	10.24	90%

Source: Information provided by MOE.

5.09 Primary education receives less as a percentage of total public recurrent expenditures in China than in most other countries, while the other two levels of education receive more (Table 5.4). The higher allocations in secondary and tertiary education reflect overstaffing, low space utilization rates and a high boarding ratio (cf. para. 5.06).

Table 5.4: PERCENTAGE DISTRIBUTION OF PUBLIC RECURRENT EDUCATIONAL EXPENDITURE, BY LEVEL OF EDUCATION

	China		Other developing countries	OECD countries
	1979	1982		
Primary education	31	38	49	44
Secondary education	39	40	31	37
Tertiary education	30	22	20	19

Source: World Bank estimates.

5.10 Salaries as a percentage of total recurrent expenditures on education are 60%, 55% and 31% in primary, secondary and tertiary education, respectively. Despite recent salary increases, these percentages are lower than those in other developing countries, where they average 90%, 60-75% and 40-55%, respectively. There are no "right" percentages. The large disparity in primary education reflects some underpayment of teachers in China, but neglect of school maintenance and of supply of materials (rather than overpayment of teachers) in other developing countries.

Prospects to the Year 2000

5.11 Recurrent expenditures in primary education are low in China. It has been shown in Chapter 4 that the target of universal primary education can be achieved with fewer teachers because of the predicted population decline. Even if the current comparatively low student/teacher ratio is maintained, the demand for teachers would go down by 30%, from 5.4-5.5 million to 3.8 million in the year 2000 (para. 4.04). The annual output of new teachers could be reduced considerably (by some 15-20%) and still meet the needs for replacement because of retirement, death, etc. The salaries of primary school staff can be assumed to rise in line with other wages, which would offset any reduction in public costs that might be expected because of the decline in teacher demand. In 1982 prices, expenditure on salaries is estimated at Y 5.6 billion and overall recurrent costs at Y 7.6 billion in the year 2000. Raising teachers' salaries relative to other wages (to improve the status of the teaching profession) would further increase recurrent costs; for example, a 50% increase in teachers' salaries would amount to Y 2.5 billion in the year 2000 (for further details, see Appendix E).

Table 5.5: ESTIMATES OF PRIMARY SCHOOL ENROLLMENTS, TEACHERS AND TOTAL PUBLIC RECURRENT COSTS IN CHINA, 1982 AND 2000

	1982	2000
Students (in million)	140	94
Teachers (in million)	5.5	3.8
Public recurrent costs (in Y billion)	4.9	7.6

5.12 Savings in primary education could be achieved by more consistent use of multigrade schools (instead of single grade schools) and of class teachers (instead of subject teachers) in rural areas. An increase in teacher workloads to the standards of advanced countries would imply additional savings. This increase could be undertaken without reducing class sizes, which average 34 students and are already slightly below the median for LDC countries. The achievement of universal primary education would also reduce the funding needs of nonformal primary education and adult literacy courses.

5.13 Savings achieved through improved internal efficiency could be used to raise quality; for instance the supply of didactic materials and the physical school environment could be improved. Primary teaching as a profession could be made more attractive through further salary increases (para. 4.37). To attract well qualified teachers to rural areas, salaries for rural teachers could perhaps even be set higher than those for urban teachers, to compensate for the obvious hardships of living in rural (often remote) regions.

5.14 The need for capital investment to universalize primary education is more difficult to estimate than recurrent costs. Nationwide surveys of physical facilities and of school equipment would be needed before such estimates could be made. Official Chinese estimates maintain that one million additional teachers and investments of Y 7.6 billion in buildings and Y 1.3 billion in didactic materials are needed for the universalization program. On the other hand, the World Bank estimates indicate that new teachers would only be needed for replacements, while the total stock would in fact have to be reduced. New classrooms would generally not be required, although many existing classrooms would have to be improved. Much additional teaching equipment would be needed. The Chinese estimate implies that each existing primary school classroom would have to be improved at an average cost of Y 1,900 and supplied with some educational materials at Y 320. The former figure appears high given the prevailing labor costs in China, while the latter appears reasonable.

5.15 Recurrent costs in secondary education will increase considerably during the next 15 years. The universalization of lower secondary education, which implies a 10% increase in student enrollment over the 1983 level (to

42 million students) by the year 2000,[35/] will contribute to higher costs. The major cost increase at the secondary level will be caused by more than quadrupling student enrollment in upper secondary education, from 7 million to 29-30 million students, more than half of whom will be in vocational and technical programs (up from around 2 million students in 1982 and 1983). The vocationalization program will be particularly expensive, as effective teaching of technical and vocational subjects requires lower student/teacher ratios than the teaching of academic subjects. This is true even if current ratios in technical/skilled worker training schools are raised to international standards. The demand for secondary teachers would increase from 2.9 million in 1983 to 3.7-4.4 million in the year 2000 depending on student/teacher ratios (para. 4.15). Demand for consumables and maintenance costs are also higher in technical and vocational subjects than in academic subjects.

5.16 The World Bank estimates that average public recurrent costs per student in general secondary schools are Y 90-100, with a salary component of Y 50-70. In technical and skilled worker training schools, per student costs vary greatly at Y 500-1,000, with a salary component of Y 200-400 (reflecting lower student/staff ratios). Total public recurrent costs in all types of secondary education are estimated at Y 5.5 billion for 1982, with salaries absorbing about 55%. Costs would be considerably higher in the year 2000, particularly if the current student/teacher ratios in technical/vocational education of various types are maintained.

5.17 Two scenarios have been costed for recurrent expenditure at the secondary level: (a) assumes no major change in current staffing and student boarding policies; and (b) assumes that schools increase staff/student ratios to more economical levels and simultaneously reduce support staffs (which are large, particularly in technical and skilled worker training schools). Under Scenario 1, total recurrent expenditure in the year 2000 is estimated at Y 23.0 billion, and under Scenario 2, at Y 18.7 billion. These figures show that a 70% increase in secondary level enrollments, which would require a 30-50% increase in staff, would cause recurrent costs to increase by 240-320%. An increase in teachers' salaries relative to other wages would cause a further significant increase in the recurrent cost of secondary education; for example, a 50% salary increase for teachers would add Y 5-6 billion to recurrent expenditures in the year 2000 (for further details, see Appendix E).

35/ Enrollment will peak at 48 million in the late 1980s.

Table 5.6: ESTIMATES OF SECONDARY SCHOOL ENROLLMENTS, TEACHERS AND RECURRENT COSTS, 1983 AND 2000

	1983	2000		% change
		Scen. 1	Scen. 2	
Students (in million)				
Lower secondary	38	42		
Upper secondary general	5	15		
Upper secondary vocational/technical	2	15		
Total	45	72		+70%
Teachers (in million)	2.9	4.4	3.7	+50%/30%
Public Recurrent Costs (in Y billion)	5.5	23.0	18.7	+320%/240%
Of which salaries	3.1	15.7	12.0	
Of which general education	4.3	11.0	10.1	
Of which technical/vocational	1.2	12.0	8.6	

Source: World Bank estimates.

5.18 Current projections that the 2 million students in technical and vocational education in 1983 will increase to 15 million in the year 2000 imply that 6.5 million new student places will be needed over the next 15 years in technical/vocational classes, assuming double shift teaching in workshops and laboratories. World Bank estimates, considering changed exchange rates and price increases, show that a total capital investment of Y 13.0 billion, or Y 2,000/student place, would be needed for equipment and materials for technical/vocational education programs. This would be the absolute minimum cost and assumes provision of locally made, inexpensive equipment in addition to equipment imports. It can furthermore be estimated that the provision of equipment for the 10 million additional students in academic programs would require at least Y 2.0 billion. The World Bank's estimated per student cost is higher than the Chinese estimate of approximately Y 1,000/place in rural vocationalized schools and only Y 330/place in similar urban schools. No information is available to the World Bank on capital needs for the construction of new workshops and laboratories or of complete new school buildings to provide the needed 23 million new upper secondary student places. Wide general use of double shifts, also for classrooms, would reduce the need for new construction in areas that already have secondary schools. Most of the additional students would, however, live in rural areas where no secondary schools exist, and the building program would presumably be considerable despite cost reducing measures. The Government could reduce capital and recurrent costs, and possibly also improve the quality of education offered, by making maximum use of facilities in industries, hospitals, etc., for students' workshop and laboratory work.

5.19 Recurrent cost implications of the primary and secondary education programs for teacher training are comparatively minor.[36/] No expansion of preservice training for primary teachers is needed, but the large inservice programs need to continue. Recurrent expenditures for primary teacher training could thus remain largely unchanged for the next few years. The recurrent cost of primary teacher education, amounting to Y 0.3 billion/year or Y 800/student, have already been included in the secondary education costs given above.

5.20 It was assumed that preservice training of secondary teachers would double, from the output of 130,000 graduates in 1982 to 260,000 by the year 2000, reflecting the projected doubling of higher education enrollments. Unit recurrent costs in departments of teacher training at the colleges and universities, including student boarding, are estimated at Y 1,500 in 1982, so the program of preservice teacher training would then double the 1982 recurrent costs of approximately Y 0.6 billion, to Y 1.2 billion (in 1982 costs), by the year 2000.

5.21 Capital costs in teacher training would mainly be for the procurement of much needed equipment. Better use of teaching facilities and enrollment of day students would reduce the need for construction of new buildings. Capital investment is estimated at Y 2,000/new student place, or a total of Y 0.8 billion.

5.22 To make complete estimates of education expenditure to the year 2000, the cost of higher education (other than teacher training) must be added to the above estimates. Total enrollment in university education is planned to double, from 1.2 million in 1982 to about 2.4 million by the end of the century to meet the demand for professional manpower generated by the national modernization program. There is scope for large savings through better staff utilization (the current student/teacher ratio of 4:1 is expected to improve to 7:1 or better by the year 2000); improving space and equipment utilization rates also offers opportunities for reducing unit costs. Public recurrent costs in university and college education, estimated at Y 3.1 billion (including teacher training) in 1982, would nonetheless probably at least double, to Y 6.9 billion, because of increases in salaries (for further details, see Appendix E). Equipment needs would be large, estimated at a minimum of Y 4,000/new student place, or a total of, say, Y 5.0 billion (also including teacher training).

5.23 Assuming that teachers' salaries grow in line with increases in GNP/capita, the total recurrent costs of these various types of public education could thus amount to Y 33-38 billion in the year 2000, compared with

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36/ The following estimates exclude costs for inservice training, which are difficult to estimate.

Y 14 billion in 1982.[37/] Increasing teachers' salaries relative to other wages would raise this estimate; for example, a 50% increase in teachers' salaries would add Y 9-10 billion to recurrent expenditure in the year 2000. Total capital needs for equipment might be at least Y 21 billion during the period 1982-2000.

Table 5.7: SUMMARY OF ESTIMATES OF TOTAL PUBLIC RECURRENT COSTS, 1982 AND 2000, AND CAPITAL EQUIPMENT NEEDS, 1982-2000, IN EDUCATION
(Y billion in 1982 prices)

	Recurrent costs /a		Capital needs /b	
	1982	2000	1982-2000	p.a. est.
Primary education	4.9	7.6	1.3	0.07
Secondary education (including primary teacher training)	5.5	23.0/18.7	15.0	0.79
Tertiary education (including secondary teacher training)	3.1	6.9	5.0	0.26
(of which teacher training)	(0.6)	(1.4)	(0.8)	(0.04)
Total Costs	13.5	37.5/33.2	21.3	1.12

/a For details, see Appendix E.
/a Equipment only. In addition, building needs could amount to 10% of annual recurrent costs.

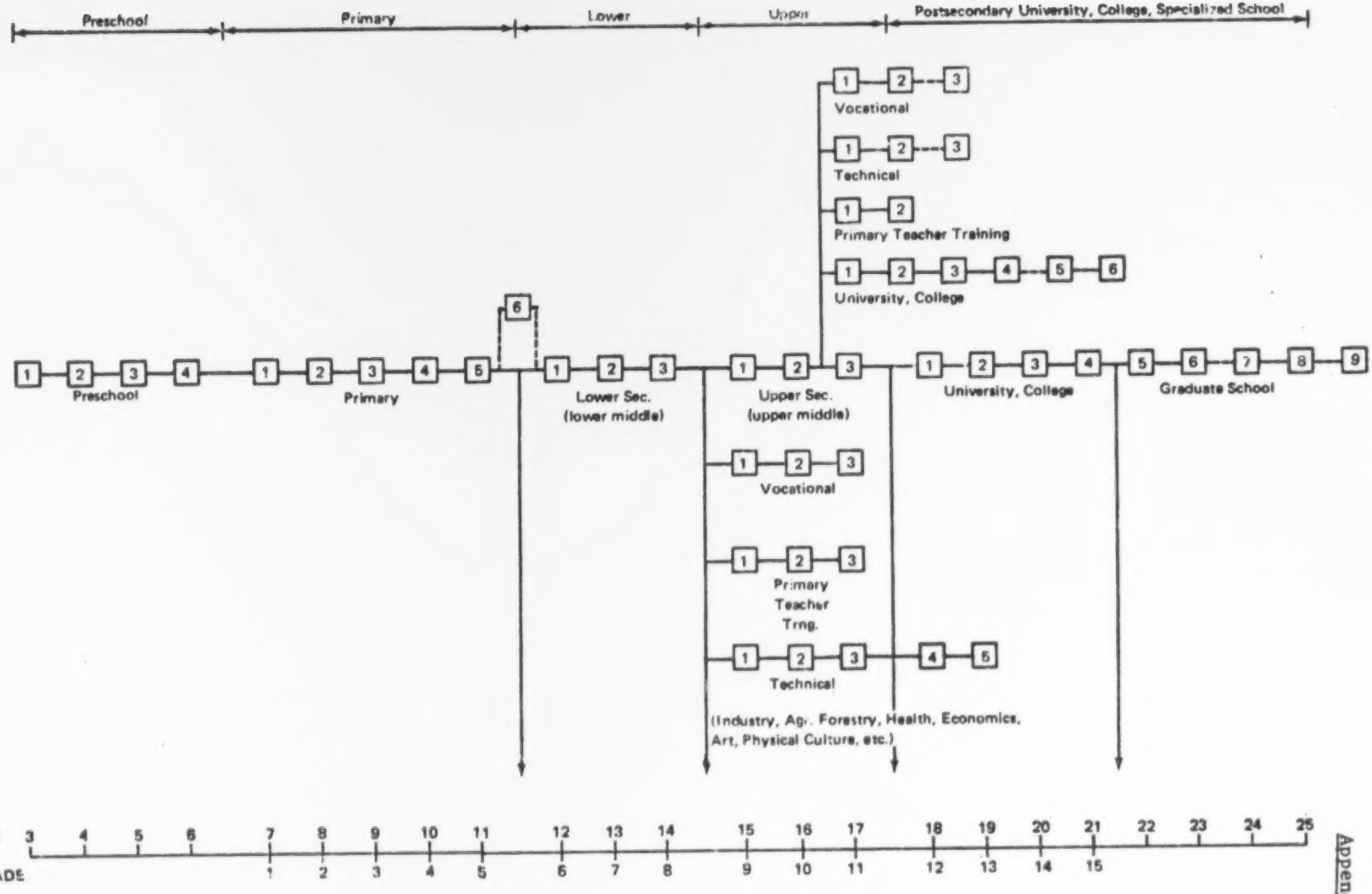
Source: World Bank estimates.

5.24 The estimates discussed in previous paragraphs are tentative and indicate only the magnitude of future public recurrent education costs and capital equipment needs. Furthermore, no estimates could be included to cover capital needs for new building construction, because no surveys showing the school building situation nationwide were available (paras. 5.14 and 5.18), but these could amount to 10% of annual recurrent costs. China estimates that its GNP will triple before the end of the century. This anticipated economic growth, together with favorable demographic trends and the possibilities for improving internal efficiency, offers China the opportunity to both meet the financial needs of planned educational development and achieve quality improvements, without increasing its allocation to education as a share of GNP. Even if teachers' salaries were increased by 50% relative to other

37/ A continuation of postsecondary level technician training would further increase costs.

wages, public expenditure on education would remain at around the current share (3.1%) of GNP, which is still below the median share for other LDCs (para. 5.04).

STRUCTURE OF EDUCATION IN CHINA


Preschool
Primary
Lower
Upper
Postsecondary University, College, Specialized School
Vocational
Technical
Primary Teacher Training
University, College
Preschool
Primary
Lower Sec. (lower middle)
Upper Sec. (upper middle)
University, College
Graduate School
Vocational
Primary Teacher Trng.
Technical
(Industry, Ag., Forestry, Health, Economics, Art, Physical Culture, etc.)
AGE 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
GRADE 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

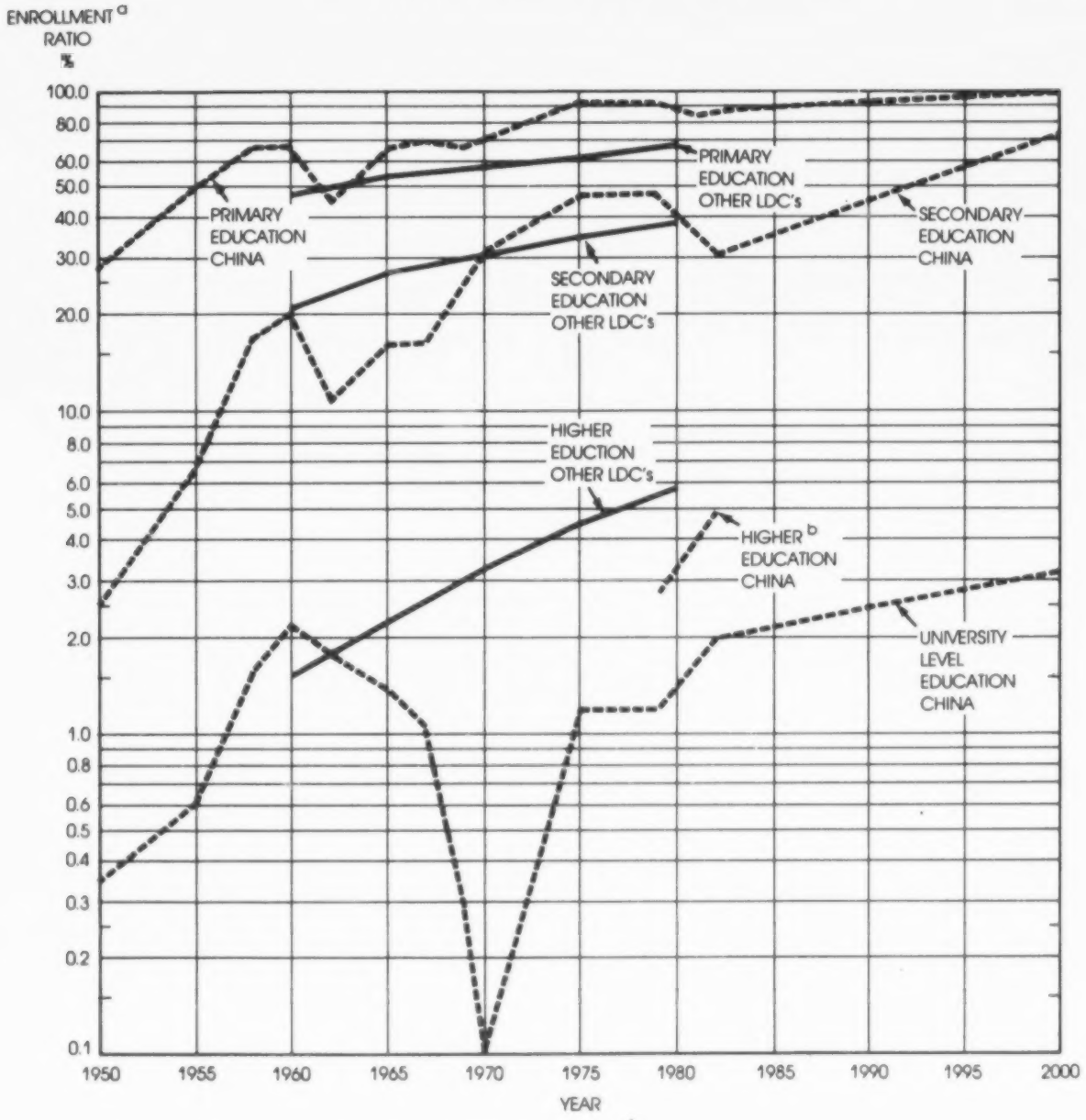
Source: Ministry of Education
June, 1984

World Bank – 22431

Appendix A1

Appendix A2

ENROLLMENT RATIOS IN FORMAL EDUCATION IN CHINA: CHINA (1950-83 AND TARGETS FOR 2000); OTHER DEVELOPING COUNTRIES (1950—1980)



[a] The enrollment ratio expresses the number of students enrolled in a level of education as a percentage of the relevant age group.
[b] Targets for non-university higher education in 2000 are not available.

Source: UNESCO Statistical Year Book
World Bank Estimates

World Bank—27353

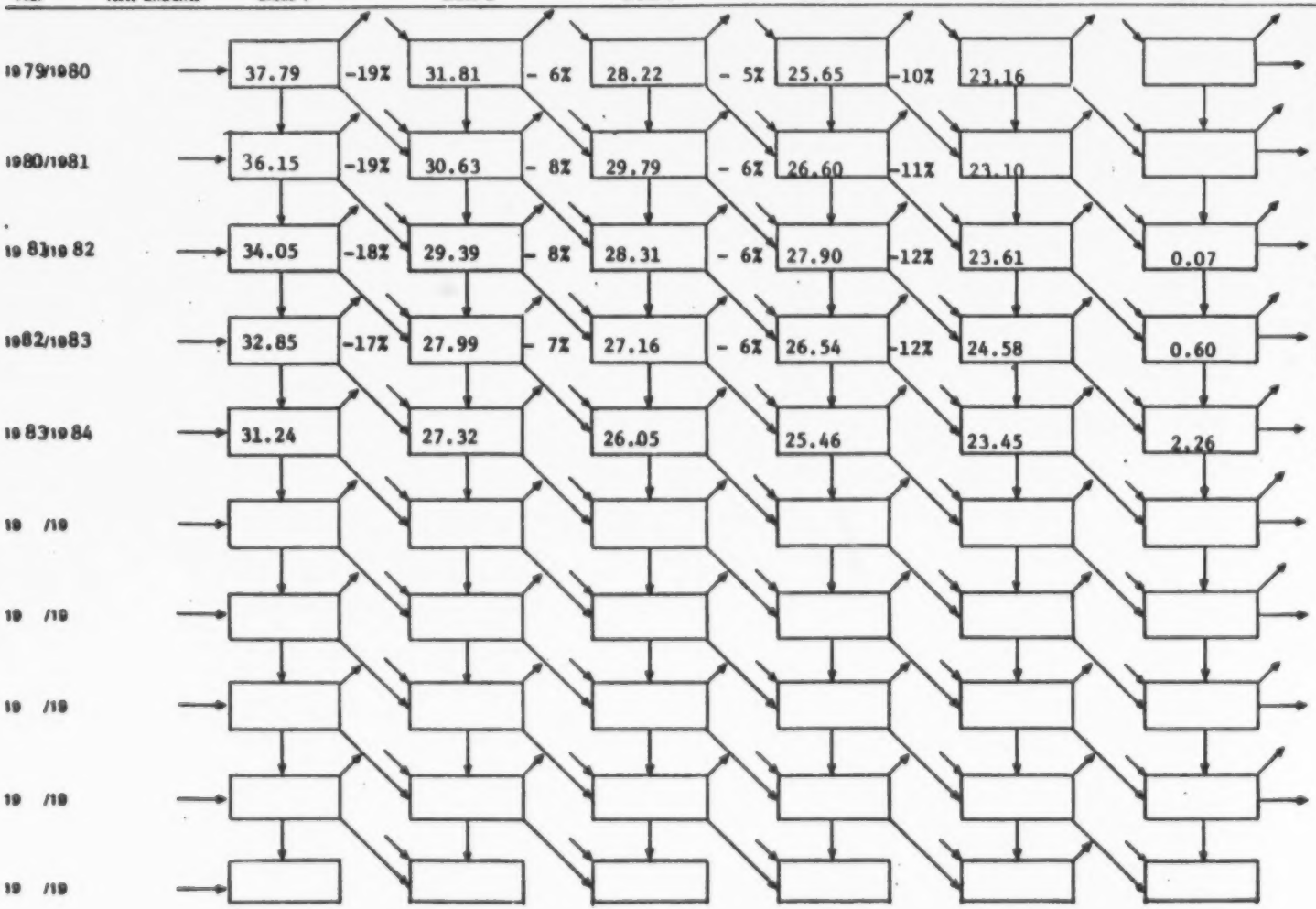
CHINA

FORM NO. 1632
(3-80)

STUDENT FLOWCHART
(showing intake, enrollment, repetition, dropout and graduation)

ED. SECTOR
IBRD

Primary Education, 1979-83



a/ Numbers in round brackets () refer to total enrollment.
b/ Numbers in square brackets [] refer to dropout rate from primary to lower secondary.

Appendix B
Table 1.1

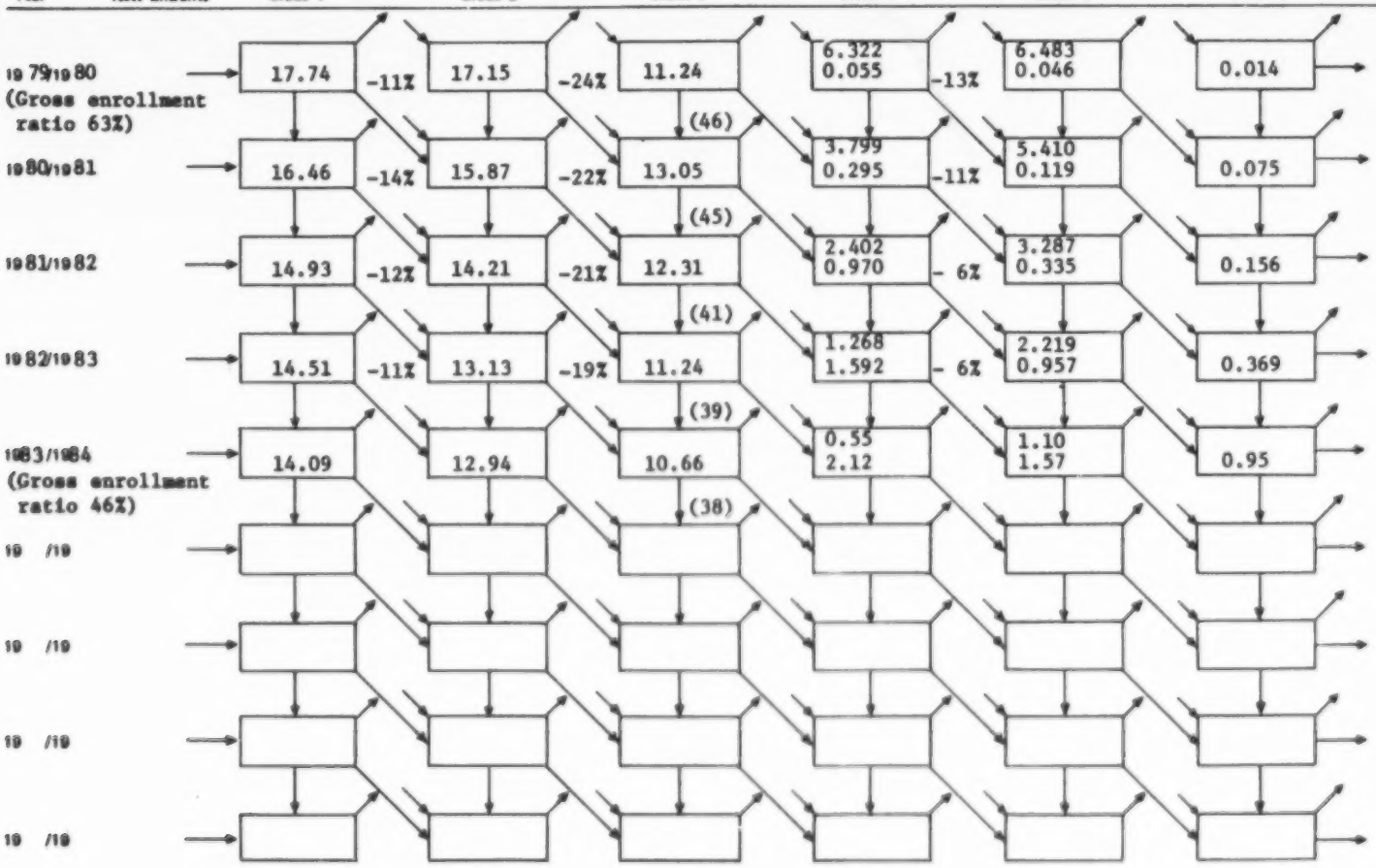
CHINA

FORM NO. 1632
(2-80)

STUDENT FLOWCHART
(showing intake, enrollment, repetition, dropout and graduation)

ED. SECTOR
IBRD

Secondary Education, 1979-83



a/ Numbers in round brackets () refer to total enrollment.
b/ Excluding students in vocationalized schools.

Appendix B
Table 1.2

Appendix B
Table 2

CHINA

Number of Students, Schools and Teachers, 1979-83

	1979	1980	1981	1982	1983
Primary Education					
Students	146.6	146.3	143.3	139.7	135.8
Primary schools (mln)	0.920	0.917	0.894	0.881	0.862
Primary teachers (mln)	5.382	5.499	5.58	5.50	5.42/a
Primary classes (mln)	4.270	4.279	4.20	4.093	4.043
Primary school administrative staff (mln)	0.493	0.555	0.585	0.608	0.635
Student/school ratio	159	159	160	158.7	157.5
Student/teacher ratio	27.2	26.6	25.7	25.4	25.0
Student/class ratio	34.3	34.2	34.1	34.1	33.6
Secondary Education					
Students	59.1	55.1	48.6	45.3	44.0
Lower secondary teachers (mln)	2.400	2.449	2.35	2.215	2.146/b
Upper secondary teachers (mln)	0.667	0.571	0.494	0.466	0.451/c
General secondary schools (mln)	0.144	0.118	0.107	0.102	0.097
Student/teacher ratio	19.3	18.2	17.1	16.9	16.9
Student/school ratio	410	465	455	446	445
Primary Teacher Training					
Students	484,000	482,000	437,000	411,000	455,000/d
Schools	1,053	1,017	962	908	861
Teachers	34,000	37,700	37,500	39,300	40,400
Graduates	102,000	209,000	240,000	204,000	145,000
Student/school ratio	460	474	454	453	528
Student/teacher ratio	14.0	12.8	11.7	10.5	11.3

/a 40-50% unqualified.

/b 70% unqualified.

/c 40% unqualified.

/d 80% at senior secondary level.

Appendix B
Table 3.1

CHINA

Technical and Skilled Worker Training Schools: Number of Students, Schools and Teachers 1979-83

	No. of schools	No. of students (mln)	No. of graduates (mln)	No. of teachers (mln)	Student/ school ratio	Student/ teacher ratio
Industry						
1979	627	0.243	0.024			
1980	643	0.263	0.058			
1981	658	0.203	0.138			
1982	672	0.216	0.069			
1983	670	0.234	0.065			
Agriculture						
1979	337	0.110	0.011			
1980	337	0.114	0.029			
1981	352	0.083	0.059			
1982	349	0.077	0.035			
1983	365	0.078	0.025			
Forestry						
1979	35	0.011	0.002			
1980	36	0.012	0.003			
1981	38	0.011	0.006			
1982	38	0.013	0.004			
1983	39	0.014	0.004			
Politics/Law						
1979	-	-	-			
1980	-	-	-			
1981	44	0.017	0.007			
1982	64	0.022	0.008			
1983	82	0.027	0.010			
Medical/Health						
1979	543	0.210	0.025			
1980	555	0.225	0.054			
1981	556	0.183	0.094			
1982	526	0.163	0.070			
1983	520	0.163	0.063			
Economics/Business						
1979	297	0.105	0.013			
1980	319	0.107	0.047			
1981	360	0.107	0.054			
1982	363	0.110	0.050			
1983	375	0.146	0.058			
Physical Culture						
1979	23	0.005	0.004			
1980	26	0.006	0.001			
1981	30	0.007	0.001			
1982	29	0.007	0.001			
1983	31	0.007	0.002			
Arts						
1979	70	0.012	0.002			
1980	83	0.016	0.002			
1981	95	0.016	0.004			
1982	93	0.015	0.003			
1983	97	0.017	0.003			
Others						
1979	48	0.016	0.001			
1980	53	0.018	0.007			
1981	37	0.005	0.002			
1982	34	0.005	0.002			
1983	50	0.003	0.001			
Total						
1979	1,980	0.714	0.079	0.083	360	8.6
1980	2,052	0.761	0.201	0.091	371	8.4
1981	2,170	0.632	0.365	0.098	291	6.4
1982	2,168	0.628/a	0.242	0.110/b	290	5.7
1983	2,229	0.688	0.230	0.116	309	5.9
Skilled Worker Training Schools						
1979	3,000	0.640	0.097	0.055	210	11.6
1980	3,305	0.700	0.255	0.061	212	11.4
1981	3,669	0.679	0.353	0.080	185	8.5
1982	3,367	0.512	0.323	0.074	152	6.9
1983	3,357	0.523	0.268	0.085	155	6.2

/a 80% at the postsecondary level
/b 30-35% unqualified.

Appendix B
Table 3.2

CHINA

Vocationalized Secondary Schools

A. 1983 Enrollment in Vocationalized Secondary Schools

	Extended lower	Upper	Total
Total	301,000	919,000	1,220,000/a
Of which in agriculture	275,000	407,000	682,000

B. 1983 Enrollment ('000) in Vocationalized Upper Secondary Schools, by Grade

	2-year system			3-year system			
	Grade 1	Grade 2	Total	Grade 1	Grade 2	Grade 3	Total
Total	246	138	384	344	132	59	535
Of which in agric.	108	48	156	177	56	18	251

C. 1983 Enrollment, Year I Admissions and Output, in Vocationalized Upper Secondary Schools, by Major Field

Major field	Enrollment	Year I admissions	Output
Agriculture	366,100	254,500	52,400
Engineering	199,500	116,100	48,500
Repair services	73,900	48,200	15,600
Economics/finance	61,600	34,700	14,800
Forestry	49,700	34,400	5,300
Teacher training	31,100	19,400	4,300
Medicine	16,900	11,100	2,200
Art	14,900	8,900	3,100
Physical education	3,600	2,300	600
Politics/law	1,500	300	200
Others	100,100	59,800	22,600
Total	918,900	589,700	169,600

/a 1981: 481,000; 1982: 704,000.

Source: Department of Vocational Education, Ministry of Education, March 1984.

CHINA

Student Enrollment in Various Types of Postsecondary Institutions, 1979-82/83

	Total					Comprehensive University				Institute of Science and Engineering				Institute of Agriculture and Forestry			
	1979	1980	1981	1982	1983	1979	1980	1981	1982	1979	1980	1981	1982	1979	1980	1981	1982
Beijing	72,991	83,032	98,103	94,864	90,894	12,061	12,541	15,403	15,093	33,279	37,819	44,039	42,202	2,528	2,367	3,065	2,805
Tianjin	28,197	29,906	36,645	34,622	34,000	4,571	4,724	5,784	5,384	14,425	15,341	19,053	18,550	292	292	291	62
Hebei	35,952	41,452	44,975	38,718	41,888	2,333	3,211	4,084	3,579	11,251	12,344	14,805	12,196	4,293	4,731	5,437	4,928
Shanxi	25,308	33,104	36,975	31,733	32,868	3,185	4,409	5,472	4,741	7,334	9,822	12,029	9,798	2,246	2,827	3,449	2,325
Nei Mongol	15,674	17,405	20,576	19,518	21,472	1,289	1,600	2,113	2,000	2,309	2,771	3,482	2,972	1,549	2,280	3,055	3,257
Liaoning	58,007	63,255	74,850	60,979	67,218	2,965	3,994	5,118	4,772	32,582	35,115	41,151	29,805	2,569	3,073	3,514	2,299
Jilin	35,670	38,006	46,454	43,360	44,340	5,977	6,081	7,448	5,861	10,661	11,965	14,864	12,627	2,446	3,158	4,082	3,550
Heilongjiang	40,556	43,627	49,590	43,357	45,290	2,187	2,236	2,967	2,644	15,992	17,485	20,980	15,684	4,276	4,444	5,109	4,151
Shanghai	67,404	73,370	87,258	83,918	78,696	5,520	5,035	6,415	5,647	38,979	44,264	52,285	47,153	472	1,264	1,535	1,338
Jiangsu	73,943	82,522	82,560	71,966	78,962	4,855	5,398	5,990	8,326	26,981	32,414	38,849	31,208	2,902	3,324	3,649	2,815
Zhejiang	32,227	37,592	41,020	36,869	39,008	3,784	4,794	5,890	4,870	8,929	10,413	13,191	10,788	3,289	4,082	4,868	3,558
Anhui	33,290	37,627	45,491	40,501	42,801	3,533	4,587	5,464	3,454	10,095	12,034	14,670	12,299	2,295	2,860	3,449	2,904
Fujian	40,555	38,555	30,370	27,108	29,310	4,155	4,513	5,376	4,420	7,118	8,049	7,627	7,043	4,528	4,045	3,526	2,851
Jiangxi	29,139	35,623	37,857	35,747	36,362	2,195	2,715	3,379	2,843	7,206	8,214	9,924	8,151	2,149	2,081	2,418	2,442
Shandong	44,771	51,427	59,645	52,443	55,276	3,376	4,518	5,809	4,9504	12,917	16,147	19,551	15,658	3,515	4,058	4,828	3,368
Henan	33,804	44,985	47,813	46,228	48,117	2,603	3,411	4,220	3,829	5,853	7,912	9,968	8,252	3,733	5,323	5,533	5,438
Hubei	60,200	65,296	74,095	68,065	74,890	4,062	4,304	5,618	4,961	24,304	27,149	34,506	29,172	3,553	3,901	3,808	3,002
Hunan	42,912	51,946	54,739	48,172	51,519	2,500	3,319	3,367	3,771	14,129	15,770	19,316	14,648	4,356	5,685	5,512	3,480
Guangdong	42,382	44,053	47,570	44,511	48,818	5,411	6,332	8,086	7,562	9,132	8,490	10,544	8,046	6,255	5,975	5,611	4,761
Guangxi	21,213	25,521	24,320	21,117	21,786	2,687	2,939	3,723	2,975	1,137	1,980	2,485	2,516	2,162	2,550	2,993	1,939
Sichuan	69,055	74,742	86,067	73,955	79,403	5,216	5,633	5,147	4,466	24,598	24,845	31,925	26,899	5,118	6,389	6,711	5,163
Guizhou	18,244	17,062	18,104	16,730	16,934	1,767	1,735	2,034	1,732	2,235	2,015	2,311	1,707	1,601	1,795	1,807	1,542
Yunnan	18,979	18,136	21,729	19,279	20,856	2,874	2,962	3,722	3,225	4,108	4,065	5,126	4,235	915	1,282	1,627	1,380
Xizang	1,480	1,494	1,522	1,214	1,325	–	–	–	–	–	–	–	–	591	412	354	256
Shaanxi	43,392	53,231	63,245	56,073	60,289	3,392	5,844	5,044	4,157	22,592	28,177	34,538	28,448	1,974	2,513	2,768	2,551
Gansu	15,563	18,107	20,887	17,252	18,138	2,721	3,716	4,709	4,264	3,725	4,169	4,948	3,471	1,225	1,439	1,560	1,015
Qinghai	3,736	4,238	5,367	4,736	4,852	–	–	–	–	479	637	728	565	84	164	259	293
Ningxia	3,630	4,156	5,161	4,528	5,083	1,350	1,789	2,264	1,878	–	–	–	–	841	891	1,159	1,005
Xinjiang	11,666	14,242	16,495	16,191	16,438	2,699	3,241	3,854	3,778	1,190	1,549	1,763	1,526	2,865	3,447	4,152	3,690
Total	1,019,950	1,143,712	1,279,472	1,151,954	1,206,823	99,268	115,671	138,500	125,200	353,540	400,955	484,658	405,619	76,622	86,652	96,128	78,168

	Institute of Teacher Training				Institute of Medicine and Pharmacy				Short-term colleges				Others			
	1979	1980	1981	1982	1979	1980	1981	1982	1979	1980	1981	1982	1979	1980	1981	1982
Beijing	7,999	9,636	11,031	9,645	5,294	5,221	6,047	6,672	-	-	-	986	11,830	15,448	18,518	17,461
Tianjin	3,877	4,200	4,624	3,711	2,139	2,387	3,054	3,246	-	-	-	330	2,893	2,962	3,839	3,339
Hebei	13,150	15,242	14,529	11,631	4,734	5,649	5,711	5,953	-	-	-	-	191	275	398	413
Shanxi	7,898	9,920	9,473	8,376	3,268	4,317	4,391	4,907	-	-	-	-	1,377	1,809	2,161	1,586
Nei Mongol	8,107	7,860	8,226	7,086	2,204	2,517	3,068	3,417	-	-	-	-	216	377	632	786
Liaoning	10,429	10,339	11,690	10,762	5,876	6,117	7,547	7,762	-	-	-	-	3,586	4,617	5,830	5,579
Jilin	10,948	10,646	12,388	10,917	4,721	4,672	5,691	6,364	-	-	-	2,113	917	1,484	1,981	2,128
Heilongjiang	11,532	12,354	12,144	12,667	5,090	5,110	6,062	5,698	-	-	-	236	1,489	1,908	2,328	2,277
Shanghai	11,267	10,151	11,814	9,905	5,798	5,531	6,795	7,695	-	-	-	3,445	5,368	7,125	8,414	8,735
Jiangsu	26,628	28,259	18,977	12,707	11,868	12,043	13,365	11,395	-	-	-	3,715	709	1,084	1,730	1,800
Zhejiang	11,693	13,144	10,854	10,826	3,768	3,979	4,714	4,569	-	-	-	781	764	1,180	1,503	1,477
Anhui	12,973	12,439	15,013	13,011	3,968	5,061	6,027	5,763	-	-	-	2,128	426	646	868	942
Fujian	20,759	17,523	10,738	9,193	3,092	3,320	2,719	2,670	-	-	-	386	903	1,105	384	545
Jiangxi	11,405	15,178	13,623	14,194	5,320	5,902	6,430	6,218	-	-	-	-	864	1,533	2,083	1,899
Shandong	17,446	16,450	17,973	16,577	7,297	9,660	10,594	10,178	-	-	-	649	220	594	890	1,063
Henan	15,843	20,432	19,318	17,787	5,254	7,073	7,939	8,167	-	-	-	1,851	518	834	835	904
Hubei	15,400	16,867	14,758	13,914	9,672	9,336	10,612	9,969	-	-	-	2,467	3,209	3,739	4,793	4,580
Hunan	14,721	19,340	17,528	16,779	5,328	6,541	7,417	7,554	-	-	-	-	1,878	1,291	1,599	1,940
Guangdong	12,003	13,359	11,405	11,274	7,081	7,211	8,491	9,503	-	-	-	547	2,500	2,686	3,433	2,818
Guangxi	10,021	11,880	8,329	7,286	3,506	4,178	4,508	4,732	-	-	-	-	1,700	1,994	2,282	1,669
Sichuan	20,778	22,815	23,887	20,309	8,219	8,560	9,952	9,467	-	-	-	-	5,126	6,500	8,445	7,651
Guizhou	8,367	7,218	6,704	6,005	3,750	3,565	4,208	4,724	-	-	-	-	524	734	1,040	1,020
Yunnan	7,993	6,289	6,723	5,388	2,213	2,311	2,863	3,447	-	-	-	-	876	1,227	1,669	1,604
Xizang	441	555	606	540	133	133	49	-	-	-	-	-	315	394	513	418
Shaanxi	8,181	9,788	11,935	10,804	2,206	2,940	3,922	4,531	-	-	-	711	5,047	3,969	5,038	4,871
Gansu	5,651	6,056	6,192	4,625	1,241	1,697	2,141	2,475	-	-	-	115	1,000	1,030	1,337	1,287
Qinghai	1,641	1,636	2,172	1,812	684	693	856	947	-	-	-	-	848	1,108	1,352	1,119
Ningxia	697	724	780	720	742	752	958	925	-	-	-	-	-	-	-	-
Xinjiang	2,326	2,872	3,351	3,377	2,167	2,469	2,584	2,921	-	-	-	-	419	664	791	899
Total	310,174	333,172	316,785	281,828	126,633	138,945	158,715	161,869	-	-	-	20,460	55,713	68,317	84,686	80,810

Appendix B
Table 4
Page 2 of 2

CHINA

Number of Various Types of Postsecondary Institutions, by Province - 1979, 1981 and 1982

	Total				Comprehensive universities			Inst. of Science & Engineering			Inst. of Agri. & Forestry			Inst. of Teacher Training			Inst. of Medicine & Pharmacy			Others		
	1979	1981	1982	1983	1979	1981	1982	1979	1981	1982	1979	1981	1982	1979	1981	1982	1979	1981	1982	1979	1981	1982
Beijing	48	51	51	55	2	2	2	14	15	15	5	4	4	3	3	3	4	4	4	21	23	23
Tianjin	14	17	19	21	1	1	1	4	4	5	-	-	1	2	3	3	3	3	3	4	6	6
Hebei	27	27	29	33	1	1	1	10	10	10	3	3	3	8	8	10	4	4	4	1	1	1
Shanxi	16	16	17	17	1	1	1	5	4	4	1	1	1	5	6	7	3	3	3	1	1	1
Nei Mongol	13	14	14	14	1	1	1	2	2	2	3	3	3	4	4	4	3	3	3	-	1	1
Liaoning	34	38	39	50	1	1	1	15	16	16	2	2	2	5	7	7	6	6	6	5	6	7
Jilin	25	28	27	32	2	2	2	8	8	8	4	4	3	5	7	7	4	4	4	2	3	3
Heilongjiang	27	31	31	36	1	1	1	10	10	10	3	3	3	6	9	9	5	5	5	2	3	3
Shanghai	27	34	34	38	1	1	1	15	16	16	0	2	2	2	2	2	3	4	4	6	9	9
Jiangsu	19	22	48	58	1	1	1	3	4	4	3	3	3	7	8	8	3	3	3	2	3	3
Zhejiang	19	22	22	24	1	1	1	3	4	4	3	3	3	7	8	8	3	3	3	2	3	3
Anhui	20	23	22	30	2	2	1	6	6	6	1	1	2	6	9	8	4	4	4	1	1	1
Fujian	16	18	18	21	1	1	1	4	4	4	3	3	3	5	7	7	2	2	2	1	1	1
Jianxi	17	17	19	19	1	1	1	6	6	6	1	1	1	5	5	7	3	3	3	1	1	1
Shandong	34	37	37	37	1	1	1	11	11	11	2	2	2	10	11	11	7	9	9	3	3	3
Henan	24	26	26	31	1	1	1	5	6	6	4	4	4	8	9	9	5	5	5	1	1	1
Hubei	33	37	37	46	1	1	1	13	16	16	1	1	1	9	9	9	6	6	6	3	4	4
Hunan	22	23	23	26	2	2	2	6	5	5	2	2	2	8	10	10	3	3	3	1	1	1
Guangdong	29	31	33	36	2	2	2	3	3	3	4	5	5	8	8	10	7	7	7	5	6	6
Guangxi	17	18	16	17	1	1	1	4	5	3	1	1	1	5	5	5	4	4	4	2	2	2
Sichuan	42	44	47	48	1	1	1	12	14	14	5	5	5	12	12	15	5	5	5	7	7	7
Guizhou	14	16	16	16	1	1	1	1	1	1	1	1	1	6	8	8	3	3	3	2	2	2
Yunnan	15	18	19	20	1	1	1	2	2	2	2	2	2	7	8	8	2	2	3	1	3	3
Xizang	4	4	3	3	-	-	-	-	-	-	1	1	1	1	1	1	1	1	-	1	1	1
Shaanxi	28	33	33	34	2	1	1	13	14	14	1	2	2	5	6	6	3	4	4	4	6	6
Gansu	12	13	13	14	1	1	1	2	2	2	1	1	1	5	5	5	2	2	2	1	1	1
Qinghai	6	6	6	6	-	-	-	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1
Ningxia	4	4	4	6	1	1	1	-	-	-	1	1	1	1	1	1	1	1	1	-	-	-
Xinjiang	10	12	12	13	1	1	1	1	1	1	3	3	3	3	4	4	2	2	2	-	1	1
Total	633	704	715	801	33	32	32	191	207	206	61	65	66	161	186	194	107	112	112	80	102	105

Appendix B
Table 6

CHINA

Number of Graduates of Higher Education, by Discipline, 1979-83

Classification	1979	1980	1981	1982	1983
Engineering	21,362	44,164	12,199	172,236	NA
Agriculture	9,748	4,009	7,902	32,562	NA
Forestry	1,281	1,249	933	5,488	NA
Medicine and pharmacy	13,483	17,656	9,512	25,963	NA
Teacher training	24,331	61,942	103,422	129,463/a	NA
Liberal arts	5,421	6,213	1,210	27,449	NA
Science	5,682	8,421	1,989	40,747	NA
Finance and economics	1,904	1,268	2,079	13,143	NA
Politics and law	-	109	-	1,238	NA
Physical culture	1,498	1,010	73	5,647	NA
Arts	375	594	321	3,308	NA
Total	85,085	146,635	139,640	457,244	335,344

NA = Not available.

/a Approximately 100,000 in academic subjects and 30,000 in vocational/technical subjects.

Source: Ministry of Education.

Appendix B
Table 7

CHINA

Higher Education Institutions and Students, by Classification, 1979-83

	1979	1980	1981	1982	1983
Number of higher education institutions	633	675	704	715	801
Number of students	1,020,000	1,144,000	1,279,000	1,154,000	1,206,000
Full-time teaching staff	237,000	247,000	250,000	287,000	303,000
Student/teacher ratio	4.0	4.6	5.1	4.0	4.2
Student/college-university ratio	1,600	1,700	1,800	1,600	1,500
Intake		270,000	276,000	331,000	391,000
Number of graduates	85,000	147,000	140,000	457,000	335,000
Number of postgraduate students	15,500	17,700	15,600	21,300	30,600

Source: Ministry of Education.

Appendix B
Table 8

CHINA

Students, Schools and Teachers in Nonformal Education, 1979-83

	1979	1980	1981	1982	1983
Kindergarten					
Number of children (mln)	8.79	11.508	10.562	11.131	11.403
Number of kindergartens (mln)	0.166	0.17	0.13	0.122	0.136
Number of children per kindergarten	53	68	81	91	84
Number of classes (mln)	0.314	0.396	0.36	0.366	
Number of children per class	28	29	29	30	
Number of teachers (mln)	0.533	0.411	0.401	0.415	0.465
Number of children per teacher	16	28	26	27	25
Primary Level (mln)					
Total number of students	21.2	16.461	9.736	7.566	8.172
Number in literacy courses	16.4	12.209	6.213	3.96	5.287
Secondary-Postsecondary (mln)					
Total number of students	4.7	6.51	6.885	9.614	9.748
Number in lower secondary	1.5	2.69	2.988	5.582	
Number in general upper secondary	0.6	0.85	0.778	0.768	
Number in technical secondary	2.2	2.96	3.119	3.264/a	
Number in technical postsecondary	0.4	N/A	N/A	N/A	
Full-time students	0.6	N/A	N/A	N/A	
University Level					
Full-time students	200,000	253,000	278,000	357,000	926,000/b
Spare-time students	660,000	527,000	481,000	342,000	
Teachers in Nonformal Education					
Full-Time					
Primary education	0.120	0.065	0.231	0.131	N/A
Secondary education	0.026	0.033	0.085	0.134	N/A
Higher education	0.020	0.018	0.0236	0.0347	N/A
Part-Time					
Primary education	1.000	0.75	N/A	N/A	N/A
Secondary education	0.135	0.237	N/A	N/A	N/A
Higher education	0.033	0.029	N/A	N/A	N/A

N/A = Not available.

/a Figure includes an estimated 2.7 million students at the postsecondary level.
/b Total enrollment.

CHINA

Recurrent Educational Expenditure
by the Ministry of Education, 1978-82 /a
(Y 100 million)

	Salaries	Subsidies	Staff benefits	Student subsidies	Utilities & others	Consumable instr. matl.	Equipment	Maint. of buildings	Total expenditures Amount	%
Higher Education										
1978	3.39	0.14	0.14	0.94	1.39	1.21	2.67	1.05	11.40	19
1979	3.90	0.30	0.25	1.44	1.84	1.80	4.18	1.66	15.80	23
1980	4.58	0.70	0.35	1.95	2.38	1.79	4.05	1.96	17.76	21
1981	4.77	0.90	0.44	2.25	2.66	2.19	4.80	2.49	20.50	22
1982	5.11	1.08	0.41	2.27	2.27	2.51	5.01	2.63	20.10	21
Normal Schools										
1978	0.42	0.04	0.02	0.54	0.23	0.09	0.25	0.35	2.00	3
1979	0.43	0.06	0.03	0.78	0.26	0.09	0.27	0.44	2.40	3
1980	0.51	0.13	0.05	1.02	0.33	0.09	0.28	0.55	2.96	4
1981	0.53	0.15	0.06	1.04	0.36	0.10	0.27	0.52	3.03	3
1982	0.64	0.17	0.05	0.58	0.33	0.12	0.25	0.65	3.30	3
Secondary Schools										
1978	11.28	1.05	0.46	0.86	2.30	0.53	1.72	3.38	21.70	36
1979	12.10	1.71	0.76	0.88	2.44	0.51	1.68	3.51	23.90	34
1980	13.56	3.76	1.31	0.91	3.04	0.53	1.88	4.22	29.21	34
1981	13.98	4.10	1.67	0.89	3.11	0.54	2.13	4.48	30.90	33
1982	16.68	4.33	1.25	0.87	2.70	0.56	2.16	5.14	34.90	33
Primary Schools										
1978	11.23	1.36	0.58	0.06	1.16	0.17	0.61	2.37	17.70	29
1979	11.72	2.05	0.98	0.06	1.23	0.18	0.56	2.37	19.50	28
1980	13.19	4.74	1.84	0.07	1.87	0.20	0.67	2.89	25.47	30
1981	14.02	5.43	2.54	0.07	2.05	0.25	0.83	3.51	28.70	31
1982	17.59	5.86	1.55	0.09	1.72	0.24	0.85	4.16	33.90	33
Subsidies to Commune-run Schools										
1978									8.10	13
1979									8.40	12
1980									9.48	11
1981									9.26	10
1982									10.20	10
Total										100
1978	26.32	2.59	1.20	2.40	5.08	2.00	5.25	7.15	60.90	
1979	28.15	4.12	2.02	3.16	5.77	2.58	6.69	7.98	70.00	
1980	31.84	9.33	3.55	3.95	7.62	2.61	6.88	9.62	84.88	
1981	33.30	10.58	4.71	4.25	8.18	3.08	8.03	11.00	92.39	
1982	40.02	11.44	3.26	4.21	7.02	3.43	8.27	12.58	102.40	

/a These budgets do not include some items previously listed in MOE's recurrent budget.

Appendix B
Table 9.2

CHINA

State Budget Expenditure, by Activity, 1950-82
(Y billion)

	1950	1957	1965	1977	1981	1982
Total expenditure in budget	6.808	30.421	46.633	84.354	111.497	115.331
Of which:						
Capital construction	1.250	12.371	15.849	30.088	33.063	30.915
Modernization investment	-	-	-	1.710	4.156	4.270
Working capital	-	2.082	2.755	6.568	2.284	2.363
Product development	-	0.229	2.523	2.235	2.374	2.632
Geological survey	-	0.627	0.771	1.726	2.185	2.305
Industry, transport and commerce	-	1.236	1.591	1.443	2.368	2.383
Agricultural support	-	0.799	1.729	5.068	7.368	7.988
Education, culture and health	0.502	2.776	4.559	9.020	17.136	19.696
Of which:						
Health	(-)	(-)	(-)	(2.082)	(3.881)	(-)
Education	(-)	(-)	(-)	(5.300)	(9.240)	(10.240)
Defense	2.801	5.511	8.676	14.904	16.797	17.635
Administration	-	2.168	2.534	4.332	7.088	8.160
Memorandum item:						
Subsidy payments	-	-	-	-	37.300	38.200
Of which:						
Daily necessities	-	-	-	7.000/a	29.400	30.000
Agricultural inputs	-	-	-	-	2.100	2.200
Operating losses of state-owned enterprises	-	-	-	-	4.200	3.600
Total budgetary expenditure plus subsidies	-	-	-	-	148.797	151.531

/a Estimated from the figure of Y 7.8 billion for 1978.

Source: Ministry of Finance.

Appendix B
Table 10

CHINA

Enrollment in Formal Education, 1949-83
(Million students)

Year	Primary	Secondary	Tertiary	Total
1949	24.39	1.27	0.117	25.78
1950	28.92	1.57	0.137	30.63
1951	43.15	1.96	0.153	45.26
1952	51.10	3.15	0.191	54.44
1953	51.66	3.63	0.212	55.50
1954	51.22	4.25	0.253	55.72
1955	53.13	4.47	0.288	57.89
1956	63.47	6.01	0.403	69.88
1957	64.28	7.08	0.441	71.80
1958	86.40	12.00	0.660	99.06
1959	91.18	12.90	0.812	104.89
1960	93.79	14.87	0.962	109.62
1961	75.79	10.34	0.947	87.08
1962	69.24	8.34	0.830	78.41
1963	71.58	8.38	0.750	80.71
1964	92.95	10.20	0.685	103.84
1965	116.21	14.32	0.674	131.20
1966	103.42	12.97	0.534	116.92
1967	102.44	12.55	0.409	115.40
1968	100.36	14.05	0.259	114.67
1969	100.67	20.25	0.109	121.03
1970	105.28	26.48	0.048	131.81
1971	112.11	31.49	0.083	143.68
1972	125.49	36.17	0.194	161.85
1973	135.70	34.95	0.314	170.96
1974	144.81	37.14	0.430	182.38
1975	150.94	45.37	0.501	196.81
1976	150.06	59.06	0.565	209.69
1977	146.18	68.49	0.625	215.30
1978	146.24	66.37	0.856	213.47
1979	146.63	60.32/a	1.591/b	208.54
1980	146.27	56.78	1.144	204.19
1981	143.33	49.84/a	1.785/b	194.96
1982	139.72	46.33/a	1.656/b	187.71
1983	135.78	46.28	1.756	183.82

/a These figures include enrollment in general secondary education, primary teacher training, skilled worker training schools and secondary-level courses in technical schools.

/b These figures include enrollment in universities, colleges and tertiary-level courses in technical schools.

Source: Ministry of Education.

Appendix B
Table 11

CHINA

Projected Enrollment in Formal Primary and Secondary Education, 1983-2000
(Million students)

Year	Primary	Secondary
1983	136	46
1984	130	50
1985	124	53
1986	117	57
1987	110	62
1988	101	67
1989	100	67
1990	99	65
1991	96	62
1992	93	59
1993	91	61
1994	90	63
1995	88	65
1996	91	67
1997	94	66
1998	94	67
1999	95	70
2000	94	71

Source: Mission estimates (6/6/84).

CHINA

Timetable of Preservice Primary Teacher Training Schools

Subject	Class hours			Total number of class hours	%
	Grade 1	Grade 2	Grade 3		
Politics	2	2	1	171	5
Chinese writing and composition	5	5	4	614	20
Basic Chinese	2	2	-		
Basic methodology of Chinese	-	-	2	62	2
Mathematics	6	6	-	420	13
Methodology of mathematics	-	-	4	124	4
Physics	3	3	3	303	10
Chemistry	3	3	-	210	7
Biology	4	-	-	144	5
Physiological hygiene	-	2	-	68	2
History	-	-	3	93	3
Geography	-	-	3	93	3
Psychology	-	2	-	68	2
Pedagogy	-	-	4	124	4
Sports and teaching methodology	2	2	3	233	8
Music and teaching methodology	2	2	2	202	6
Art and teaching methodology	2	2	2	202	6
Total class periods/week	31	31	31	3,131	100
Total class weeks/year	36	34	31		
Practice (weeks)	-	2	6		
Manual work (weeks)	2	2	-		

COMPARATIVE EDUCATION INDICATORS

May 2, 1985

	BASE YEAR	POP. MILLS. (1979) (1)	GNP PER CAPITA (US$) (1979) (2)	PERCENT GNP DEVOTED TO EDUCATION (3)	CENTRAL GOVERNMENT EXPENDITURE ON EDUCATION AS PERCENT TOTAL CENTRAL GOVERNMENT EXPENDITURE (4)	EDUCATION RECURRENT EXPENDITURES ALLOCATED TO: PRI (%)	SEC (%)	HI (%) (5)	ADULT LITERACY RATE (%) (1976) (6)	PRIMARY ENROLL. RATIO (%) (7)	COMPLETION RATE FOR PRIMARY SCHOOL CYCLE (%) (8)	PRIMARY STUDENTS PER TEACHER (9)	RECURRENT UNIT COST PRIMARY EDUCATION AS PERCENT GNP/CAPITA (10)	PROGRESSION RATE FROM PRIMARY TO SECONDARY (%) (11)	SECONDARY ENROLL. RATIO (%) (12)	SECONDARY STUDENTS PER TEACHER (13)	HIGHER ENROLL. RATIO (%) (14)
DEVELOPED COUNTRIES																		
AUSTRALIA	80	14.6[b]	8,870	6.3[a]	16.6	---	---	---	---	103[x]	100	21	---	99	73	13	20.90
CANADA	81	23.7[b]	9,650[b]	7.7[a]	18.5[av]	30[av]	34[av]	23[av]	99[b]	106[x]	100	21	19.9[av]	100	92[x]	18	22.60[x]
GERMANY F.R.	79	61.2	12,200	4.6	9.0[a]	---	---	---	99[b]	89[a]	100[a]	---	---	100[a]	96[a]	---	12.10[a]
NETHERLANDS	79	14.0	10,490	7.9	5.1	20	35	25	99[bv]	96	95	18	15.3	99	82	13	12.40
NEW ZEALAND	80	3.2[b]	6,081[b]	5.5[v]	13.6	37	31	28	99[b]	100	100	24	11.6	100	82	15	25.80[xa]
SWEDEN	79	8.3	12,250	9.0	18.2	31	10	10	99[b]	99[x]	100	18[a]	19.9	100	79[x]	104[y]	36.50[xy]
EASTERN AFRICA																		
BOTSWANA	82	1.0[b]	750[b]	---	---	49	24	11	62[b]	85	89	32	23.1	26	---	21	---
BURUNDI	81	4.2	235	2.8[bv]	19.0	43	28	27	25	29[x]	35	37	20.2	12	3[x]	17	1.00
COMOROS	84	0.4[b]	345	3.8[v]	28.0	49	29	22	49	76	40	39	---	45	36	28	0.60
DJIBOUTI	84	0.4	680	3.0	11.9	73	26	...	10	42	66	40	67.0	40	10	19	0.60
ETHIOPIA	81	32.8[b]	140[b]	2.9[a]	11.1	45	29	20	53	42	30[a]	63	19.3	93[a]	14	44	0.45
KENYA	82	17.4[b]	420[b]	5.7[v]	21.2[b]	65	16	---	48[b]	113	58	36	14.4	35	18	26	---
LESOTHO	82	1.4[b]	435[b]	5.5	16.9	38	32	26	53[b]	116[x]	41	48	9.6	46	21	21	1.30
MADAGASCAR	77	8.5	330	4.0[v]	26.0	53	28	19	50	94[bx]	33	55[b]	8.0	38	14	23	3.10[by]
MALAWI	81	6.1[b]	230[b]	3.5	11.4	38	14	25	25[b]	62	23	65	5.8	12	4	21	0.40
MAURITIUS	83	1.0[b]	1,170[b]	4.3	4.0	46	36	7	80[b]	93	72	23	13.0	100	50	22	1.00
RWANDA	83	5.5[b]	260[b]	2.7	24.5	72	16	12	37[b]	66	62	40	13.0	10	7	14	0.40
SEYCHELLES	79	0.6	1,770	5.9	22.6[a]	34[a]	33[a]	10[a]	---	---	---	25	---	---	---	---	---
SOMALIA	81	4.5	280	1.5	10.5	50[b]	46[b]	4[b]	30[b]	22[b]	80[b]	29[b]	9.0[b]	80[b]	12[b]	22	1.00
SUDAN	80	19.2[b]	380[b]	3.0	---	66	30	...	32	51[ax]	68	34	1.4	44	16	14	...
SWAZILAND	83	0.7[b]	960[b]	3.8[ab]	20.6	51	34	15	65[b]	93	50	33	11.0	98	29	18	3.00
TANZANIA	80	18.5	260	5.9	17.7	47	10	16	79[b]	98[b]	87	43	11.0	19[b]	3	20[a]	0.30
UGANDA	80	12.6[b]	300[b]	---	16.1[v]	23[b]	37[b]	20[b]	48	54[x]	61	34	---	17	5	23	0.60
ZAIRE	81	29.8[b]	210[b]	7.7	26.6	---	---	10	54[b]	76	25	30	21.0	40	18	28	2.00
ZAMBIA	80	5.7[b]	566[b]	4.5[p]	11.1	48	23	22	44[b]	95	80	48	12.9	19	16	22	1.50
ZIMBABWE	81	7.7[b]	700[b]	5.1	19.5	62	32	6	44[b]	90	55	39	20.0	85	15	23	0.50
WESTERN AFRICA																		
BENIN	79	3.4[b]	320[b]	6.5[v]	35.0	43	21	5	11[b]	42	30	46	14.0	30	11	43	1.00[y]
BURKINA	83	6.5	210[b]	2.1[v]	21.7	43	29	28	9	16	25	57	24.3	16	3	24	0.03
CAMEROON	78	8.2	590	2.9[y]	16.0[y]	33[a]	43[a]	20[a]	---	74[y]	65[a]	50[y]	11.8[a]	20[a]	14[y]	26	1.30[y]
C.A.R.	79	2.2	280	3.8[ay]	20.6[ay]	---	---	---	---	---	---	65[ay]	---	---	---	---	0.70[ay]
CHAD	76	4.4	120	2.6[bvy]	21.7[b]	---	---	---	15	25[y]	---	77	---	---	3[xy]	21	0.20[y]
CONGO	78	1.5	670	9.0[avy]	27.7[av]	---	---	---	---	---	---	56[by]	---	30	---	43[by]	6.00[ay]
GABON	77	0.6	3,420	3.7[by]	8.4[y]	---	---	---	---	---	---	48[by]	---	---	---	19[by]	2.80[ay]
GAMBIA	77	0.6	220	3.3[av]	6.5[b]	46	25[a]	6[a]	10[b]	40[by]	90[a]	27[by]	44.7[a]	40	12[bxy]	17	---
GHANA	76	11.3	400	4.0[y]	15.5[b]	---	---	---	---	71[bxy]	---	27[by]	---	---	36[bxy]	21	---
GUINEA	79	5.3	290[p]	4.6[ap]	---	25[a]	28[a]	28[a]	20	34	36	38	20.0[ap]	85	16	29	2.00[a]
IVORY COAST	81	8.2[b]	1,070[b]	10.0	45.0	33	46	13	30[b]	60	86	43	26.0	47	15[axy]	26	1.90[ay]
LIBERIA	80	1.9	520	4.6	19.6	43	23	24	30	52	32	35	20.0	76	22	20	2.90
MALI	81	7.0[b]	190	4.2[a]	21.7[a]	38	21	11	10	20	50	44	15.7	66	1	11	0.90[ay]
MAURITANIA	79	1.6[b]	320[b]	5.5	16.9	33	43	25	17[b]	32	50	44	52.0	30	9	25	0.37
NIGER	78	5.2	300	4.3[av]	16.6[ay]	52[a]	43[a]	5[a]	8	17	56[a]	61[a]	38.7[a]	40	2	24[b]	0.20[y]
NIGERIA	77	82.6	910	4.1[y]	9.6	---	---	---	---	---	---	---	---	---	10[xy]	23	0.17[y]
SENEGAL	77	5.5	450	5.0	23.0	46	34	20	10	34[bxy]	---	43[by]	---	20	10	21	2.20[by]
SIERRA LEONE	77	3.4	250	4.0[b]	16.0[b]	---	---	---	15[b]	37[x]	---	35	25.0[b]	94	15[x]	22	0.40[by]
TOGO	78	2.4	400	6.5[av]	26.5[a]	30[a]	28[a]	21[a]	18	74	40	54[by]	38.0	52	32[bxy]	48[b]	1.60[by]
LATIN AMERICA AND THE CARIBBEAN																		
ARGENTINA	78	27.3	2,210	2.7	10.9	43[a]	31[a]	18[a]	93[b]	99	52	17	---	97	31	8	27.00
BAHAMAS	79	0.2	2,770	5.7	19.1	36	36	11	93[b]	99	97	26	---	97	75	19	---
BARBADOS	78	0.2	2,680	8.5[avy]	22.1[a]	43[a]	31[a]	16[a]	99[b]	100[y]	99[a]	27[y]	19.9[a]	99[a]	78[y]	20[y]	---
BOLIVIA	80	5.4	550	4.1[ay]	30.5[a]	---	---	---	63	76[y]	---	20[y]	---	---	15[y]	---	12.40[y]
BRAZIL	79	116.5	1,770	3.8	6.2	51	---	14	76	73[ay]	---	23[ay]	4.5[b]	61[a]	15[y]	14[ay]	12.62[b]
CHILE	76	10.9	1,490	3.2[by]	13.0[b]	---	---	---	---	119[bxy]	---	34[by]	---	---	55[axy]	20[by]	11.90[by]
COLOMBIA	80	26.7[b]	1,180[b]	3.3	25.0	35	20	20	81[b]	78	36	32	8.6	---	47	20	10.02[by]
COSTA RICA	80	2.2[b]	1,810[b]	8.4	31.1	40	27	33	90	93	77	33	5.5	77	40	27	14.00
CUBA	78	9.8	---	8.0	11.0	---	---	---	96	112[bxy]	98	19[by]	---	98	51[bxy]	15	19.02[by]
DOMINICAN REP.	80	5.3	1,030	2.9	13.0	39	21	22	68[b]	80	31	59	3.2	96	30	33	16.00
ECUADOR	80	8.4[b]	1,110	6.0[p]	36.7	45	31	16	81	105	---	36	12.6	86	47	18	29.00
EL SALVADOR	77	4.4	640	3.4[by]	23.1[by]	64	8	27	62	82[bxy]	32	39	---	61	26[bxy]	27[by]	7.90[by]
GUATEMALA	78	6.8	1,010	1.7[ay]	12.6[b]	---	---	---	---	69[bxy]	---	35[by]	---	69	15[bxy]	19[by]	5.50[y]
GUYANA	76	0.8	630	8.1[by]	13.8[by]	---	---	---	---	99[bxy]	---	32[by]	---	---	59[bxy]	---	3.00[by]
HAITI	80	5.0[b]	230	1.4[v]	7.9[ay]	65	9	6	23[b]	50	20	41	19.0	62[a]	4[a]	27	0.80
HONDURAS	78	3.6	520	3.5[by]	14.3[by]	62[a]	15[a]	19[a]	60	89[bxy]	30[a]	41[by]	12.8[a]	68[a]	21[xy]	19	9.00[y]
JAMAICA	80	2.1	1,110	6.5	13.7	37	43	20	90	98	98	40	2.3	95	81	22	8.00
MEXICO	80	65.5	1,980	4.7	17.0[a]	46	39	15	92	98	53	44	9.5	88	56	17	10.10
NICARAGUA	78	2.6[b]	810[b]	3.0[bv]	14.0[b]	---	---	---	90[b]	85[bx]	24	37[b]	---	---	26[bx]	30[b]	---
PANAMA	79	1.8[b]	1,550[b]	5.5[bvy]	21.8[by]	42[a]	13[a]	13	82[b]	95[by]	---	25[by]	11.6	85[a]	50[by]	27[by]	20.40[by]
PARAGUAY	79	3.0	1,140	1.4[v]	14.2	42	17	20	84	93	32	28	3.1[b]	76	22	12	9.20
PERU	80	16.9	1,300	3.6	14.3	53	15	19	80	93	56	19	9.8	90	39	22	14.40[y]
TRINIDAD & TOB.	77	1.1	3,910	4.8[by]	8.8[by]	48	32	20	95	98	91	30	10.5[y]	69	62	24	---
URUGUAY	78	2.9	2,500	2.5	9.6	---	---	---	94	105[bx]	---	24[b]	---	---	66[bx]	---	17.80[ay]
VENEZUELA	78	14.4	3,440	5.1[y]	18.9[b]	---	---	---	82	106[bx]	---	28	---	---	38[bx]	17	21.20[y]

COMPARATIVE EDUCATION INDICATORS

May 2, 1985

	BASE YEAR	POP. MILLS. (1979) (1)	GNP PER CAPITA (US$) (1979) (2)	PERCENT GNP DEVOTED TO EDUCATION (3)	CENTRAL GOVERNMENT EXPENDITURE ON EDUCATION AS PERCENT TOTAL CENTRAL GOVERNMENT EXPENDITURE (4)	EDUCATION RECURRENT EXPENDITURES ALLOCATED TO: PRI (%) (5)	SEC (%) (5)	HI (%) (5)	ADULT LITERACY RATE (%) (1976) (6)	PRIMARY ENROLL. RATIO (%) (7)	COMPLETION RATE FOR PRIMARY SCHOOL CYCLE (%) (8)	PRIMARY STUDENTS PER TEACHER (9)	RECURRENT UNIT COST PRIMARY EDUCATION AS PERCENT GNP/CAPITA (10)	PROGRESSION RATE FROM PRIMARY TO SECONDARY (%) (11)	SECONDARY ENROLL. RATIO (%) (12)	SECONDARY STUDENTS PER TEACHER (13)	HIGHER ENROLL. RATIO (%) (14)
EAST ASIA AND THE PACIFIC																	
CHINA	83	1,025.0[b]	310[b]	3.1	7.1	38	40	22	77[b]	77	62	25	8.0	65	35	17	4.80
INDONESIA	81	150.5[b]	520	2.1	9.3	70	24	6	32[b]	98	61	37	11.0	74	27	26	3.70
KOREA	82	39.3[b]	1,636[b]	7.7[w]	20.8	34	34	31	96	99	98	43	19.0	98	84	39	21.80
MALAYSIA	84	15.2[b]	1,870[b]	5.8	22.7	39[w]	44[w]	17[w]	70[b]	97[x]	97	26	13.3[w]	90	72	22	4.00
PAPUA N.G.	83	3.0[a]	820	5.4	19.0	40	17	22	---	60	73[a]	31[a]	15.0	35	13[xz]	27[z]	1.00
PHILIPPINES	79	48.3[b]	690[b]	2.8[w]	14.0	64	36	---	75[b]	84	65	31	7.1	89	55	36	21.00
SINGAPORE	80	2.4	4,420	2.7	6.7	39	40	16	83	92	82	31	8.8	96	55	22	8.00
SOLOMON ISL.	83	0.2[b]	640[b]	6.6[pw]	19.4	41	34	20	15	78	80	27	10.5	40	22	18	2.50
THAILAND	80	47.3[b]	723[b]	3.4	20.9	59	15	13	86[b]	96	---	17	9.3	59	29	22	4.00
SOUTH ASIA																	
BANGLADESH	79	92.3[b]	90	1.1[p]	10.1[wy]	51	17	20	22[b]	63[y]	---	53	5.6	---	14	23	1.43
BHUTAN	80	1.2	80	3.6	11.0	---	---	---	10	12	---	---	---	---	---	---	---
INDIA	77	659.6	210	2.9[y]	9.9[wy]	---	---	---	36	79[x]	---	41	---	---	28[xz]	---	8.30[by]
NEPAL	82	15.0[b]	150[b]	1.4	---	---	---	---	19	70	---	38	---	---	21	23	3.70[a]
PAKISTAN	82	87.1[b]	380[b]	2.0	7.0	38	20	24	22	50	41	30	5.9	56	21	15	3.00
EUROPE, MIDDLE EAST AND NORTH AFRICA																	
AFGHANISTAN	77	15.5	---	1.7	3.7	47	19	15	12	31[by]	69	32[b]	---	62	8	22[by]	1.00[y]
ALGERIA	79	18.3	1,770	5.8[w]	12.3	34[a]	26[a]	21[a]	35	83[y]	65[x]	37	7.0[y]	55[a]	29[y]	26	3.70[y]
EGYPT	82	43.3[a]	650[a]	4.6[w]	7.9	31[a]	35[a]	26[a]	44	75[x]	80[a]	34[a]	9.8[a]	83[a]	43[a]	19[a]	17.00
GREECE	76	9.3	4,140	2.8[w]	10.6[b]	37	26	21	---	97[by]	---	29[b]	6.2[y]	---	79[bx]	27[by]	17.80[by]
IRAN	79	36.9	---	5.7[xy]	14.1[xy]	---	---	---	50	101[ax]	---	32[a]	---	---	44[ax]	24[a]	4.90[xy]
IRAQ	79	12.6	2,710	4.3[xy]	6.9[xy]	---	---	---	---	100[y]	---	28	---	---	45[xy]	29[a]	9.30[xy]
IRELAND	81	3.4[b]	4,480	6.3[xy]	11.8[xy]	---	---	---	98	93	94	29	---	98	81	14	11.00
JORDAN	81	2.2[b]	1,420[b]	4.9[w]	10.2	19	44	18	70[b]	108[x]	83	32	7.2	91	92[x]	25	19.00
LEBANON	79	2.3	---	---	18.6[xy]	---	---	---	---	96[x]	---	19	---	---	46[x]	---	27.80[xy]
MOROCCO	80	19.5	740	6.3[aw]	17.5[a]	36	44	20	28	56[xy]	35	39	19.7	40	25[x]	21	4.50
OMAN	82	0.9[b]	5,920[b]	2.5[aw]	12.7[a]	---	---	---	30[b?]	71[x]	65	25	---	86	11	14	...
PORTUGAL	79	9.8[b]	2,060	3.6	22.2	50	28	11	78	97	20	19[a]	12.8	88[x]	45[x]	17[a]	8.30[x]
ROMANIA	78	22.1	2,100	3.9[by]	6.2[y]	---	---	---	98	106[bx]	---	23[b]	---	98	84[bx]	22[b]	10.60[by]
SPAIN	76	37.0	4,920	2.1[y]	16.8[y]	---	---	---	---	98[by]	---	29[b]	---	---	67[by]	---	24.10[by]
SYRIA	78	8.6	1,170	4.4[p]	10.3	39	25	26	58	87[by]	80	35[b]	---	68	41[by]	21[b]	12.60
TUNISIA	79	6.4	1,130	7.0[p]	19.0	42	39	18	62[b]	100[x]	80	39[b]	12.8	30	30[x]	30	6.00
TURKEY	83	47.5	1,230	3.3	16.2	50	22	24	73[b]	110	77	31	6.0	55	26	11	8.00
YEMEN A.R.	80	6.8	420	5.0[pw]	12.0	94	7	7	21[b]	37	12[a]	38[y]	67.0	85	3	20	1.10
YEMEN P.D.R.	82	2.0[b]	420[b]	7.6	9.7	63[a]	14[a]	8[a]	53	61	34	25	22.0[a]	46	17	20	2.50
SUMMARY FOR DEVELOPING COUNTRIES:																	
Number of Countries:				84	93	70	69	67	81	92	68	93	65	75	91	88	85
Range:				(1.4-10.0)	(3.7-54.3)	(23-94)	(8-46)	(5-33)	(8-99)	(12-119)	(12-99)	(17-77)	(1.4-67.0)	(10-100)	(1-94)	(8-48)	(0.03-29.0)
Quartiles: Upper:				5.6	21.7	51	36	22	81	98	80	43	20	87	47	28	11.0
Median:				4.0	16.1	43	28	19	53	83	61	35	13	65	28	22	3.7
Lower:				3.0	11.0	38	21	13	25	60	35	28	9	40	14	19	1.0
Quartile Deviation:				1.3	5.4	6.5	7.5	4.5	28.0	19.0	22.5	7.0	5.6	23.5	16.5	3.5	5.0
Mean:				4.4	17.0	46	28	18	53	76	59	36	14	62	31	23	6.9
Standard Deviation:				1.9	8.7	12	10	7	29	27	24	11	13	27	23	7	7.4
Median:				4.0	16.0	43	28	19	53	83	61	35	13	65	26	22	3.7

SYMBOLS:

--- DATUM UNAVAILABLE
... MAGNITUDE NIL OR NEGLIGIBLE
? DATUM QUESTIONABLE
* INCLUDES PART-TIME STUDENTS

FOOTNOTES:

A = DATUM PRIOR TO BASE YEAR
B = DATUM MORE RECENT THAN BASE YEAR
N = CURRENT PRICES
P = GDP

S = MINISTRY OF EDUCATION (MOE) ONLY
T = MOE AND STATE GOVERNMENT ONLY
W = PUBLIC EXPENDITURE ONLY
X = INCLUDES OVER-AGE STUDENTS
Y = UNESCO SOURCES

SOURCES:

Columns 1 and 2: World Bank Atlas or IBRD missions.
Columns 3 to 14: IBRD missions, Government sources and/or Unesco Statistical Yearbook.

Comparative Education Data are useful in the evaluation of various education systems and analysis of relative stages of educational development between various countries. However, on the basis of the present data, cross-national comparison should be approached with great caution. Data presented in the above table have been collected largely by Bank missions from government sources; the remainder are staff estimates or data from Unesco. Efforts have been made to standardize definitions and, within limits, to check the accuracy of the data. Nevertheless, such data are still imperfect in several respects and the Bank is working to improve them progressively on the occasion of its operational work. In the use of these data, the following qualifications should be kept in mind:

(1) "Education" as defined in the table includes all education and training, both formal and non-formal.

(2) "Primary" education refers to education at the first level and "secondary" education refers to all education at the secondary level regardless of type (e.g., general, technical, agricultural).

(3) "Literacy rates" (col. 6) are often obtained from country censuses. In many countries they are only approximations and it is doubtful that any uniform definition of "literate" has been followed consistently.

(4) "Public expenditure in education" (cols. 4 and 5) refers to all capital and recurrent expenditures devoted to education by public and quasi-public agencies.

(5) "Enrollment ratios" (cols. 7, 12 and 14) refer to school year and are the percentage of eligible children enrolled full-time in the appropriate school, public and private by level. They are often subject to a wide margin of error in the developing countries owing to variations in the accuracy of basic data (i.e., age-specific population and enrollments). Enrollment figures frequently are higher than the number of students actually in school. Over-aged students whose inclusion is indicated by footnotes also can inflate the ratios.

CHINA

Public Recurrent Costs: Estimates of Increases at the Primary, Secondary and Higher Levels by the Year 2000
(1982 prices)

	1982	2000-I		2000-II		2000-III	
PRIMARY LEVEL							
Total Number of Staff (mln)	6.3	4.5		4.5		4.5	
Teachers	5.5	3.8		3.8		3.8	
Ancillary/admin. staff	0.8	0.7		0.7		0.7	
Expenditure on Salaries (Y bln)	2.9	2.1		5.6		8.1	
Teachers	2.7	1.9		5.1		7.6	
Ancillary/admin. staff	0.2	0.2		0.5		0.5	
Expenditure on Materials (Y bln)	2.0	2.0		2.0		2.0	
Subtotal (Y bln)	4.9	4.1		7.6		10.1	
		Scen 1	Scen 2	Scen 1	Scen 2	Scen 1	Scen 2
SECONDARY LEVEL							
Total Number of Staff (mln)	3.3	6.0	4.4	6.0	4.4	6.0	4.4
Teachers	2.9	4.4	3.7	4.4	3.7	4.4	3.7
Ancillary/admin. staff	0.4	1.6	0.7	1.6	0.7	1.6	0.7
Expenditure on Salaries (Y bln)	3.1	5.9	4.5	15.7	12.0	22.1	17.4
Teachers	2.8	4.8	4.0	12.8	10.7	19.2	16.1
Ancillary/admin. staff	0.3	1.1	0.5	2.9	1.3	2.9	1.3
Expenditure on Materials (Y bln)	2.4	7.3	6.7	7.3	6.7	7.3	6.7
Subtotal (Y bln)	5.5	13.2	11.2	23.0	18.7	29.4	24.1
HIGHER LEVEL /a							
Number of teachers (mln)	0.3	0.3		0.3		0.3	
Expenditure on Salaries (Y bln)	1.0	1.0		2.7		3.9	
Teachers	0.9	0.9		2.4		3.6	
Ancillary/admin. staff	0.1	0.1		0.3		0.3	
Expenditure on Materials (Y bln)	2.1	4.2		4.2		4.2	
Subtotal (Y bln)	3.1	5.2		6.9		8.1	
TOTAL RECURRENT COSTS (Y bln)	13.5	22.5/20.5		37.5/33.2		47.6/42.3	

Assumptions

2000-I Estimate assumes no increase in salaries. The cost of materials at the primary level is assumed to remain at Y 2.0 billion despite declines in enrollment, to allow for quality improvement. The cost of materials at the secondary level increases as a proportion of total recurrent costs because of the higher equipment and material costs involved in the vocationalization program. The slightly lower cost in Scenario 2 assumes more efficient use of some equipment and materials because the number of classes drops as student/teacher ratios are improved. Expenditure on materials at the higher level is assumed to double in line with enrollment increases.

2000-II Estimate assumes that GNP rises from about Y 450 billion to Y 1,500 billion by the year 2000, and GNP per capita rises from $300 to $800. Salaries are assumed to increase in line with GNP/capita growth (i.e. 2.67 times).

2000-III Estimate assumes that, in addition to the assumption in estimate 2000-II, the salaries of teachers will be raised by 50% relative to other wages.

/a The number of teachers is assumed to be the same in the year 2000 as in 1982 because of expected improvements in student/teacher ratios. The number of ancillary/administrative staff is unknown; salary expenditure is estimated at 90% for teaching staff and 10% for nonteaching staff.

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